IMPROVING THE RESPONSE CAPABILITIES OF RED HORSE (A FORCE MODULE APPROACH)

THESIS

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AFIT/GEM/DEE/89S-7

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Presented to the Faculty of the School of Systems and Logistics of the Air Force Institute of Technology Air University In Partial Fulfillment of the Requirements for The Degree of Master of Science in Engineering Management

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Preface

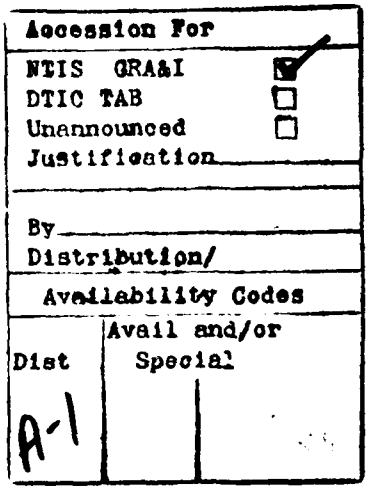
The purpose of this study was to define criteria for force module applications in RED HORSE contingency planning. The task required an enormous amount of qualitative analysis of what may be considered nonspecialized areas. Fortunately, the expertise was available in many of the RED HORSE squadrons, the engineering readiness staffs of owning MAJCOMs, and the AF Engineering and Services Center.

One of the important crossroads of this study was defining the research problem and identifying the scope and objectives of the research. In this area, enormous assistance was received from Major Tom Heck and Mr. Dick Pinto, both on the TAC staff.

I also received help from many others while building and testing the survey instrument. Special thanks to Captain David Clark for help in developing the questionnaire. I also would like to thank the respondents all of whom took the time to provide in depth responses on the survey. Your answers have been the key to completing the goals of this study.

This entire effort has been a valuable and, many times, enjoyable experience. This would not have been possible without the attention and reassurances of Capt Jon Wheeler. He provided me with the proper perspective to get the most out of this study.

Most of all, I thank my lovely wife, Nina. She has been the spark of motivation throughout this entire program. I greatly appreciate the show of patience, understanding, and support.



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List of Acronyms

AF	Air Force
ACSC	Air Command and Staff College
AFCE	Air Force Civil Engineering
AFESC	Air Force Engineering and Services Center
AFM	Air Force Manual
AFR	Air Force Regulation
AFSC	Air Force Specialty Code
BEEF	Base Engineer Emergency Force
CE	Civil Engineering
CEG	Civil Engineering Group
CECOG	Civil Engineering Construction Operations Group
COB	Collocated Operating Base
CONUS	Continental United States
DE	Directorate of Engineering
DOC	Directed Operational Capability
HQ	Headquarters
IG	Inspector General
LB	Limited Base
MAJCOM	Major Command
MOB	Main Operating Base
NAVAIDS	Navigational Aids
Oplan	Operations Plan
ORI	Operational Readiness Inspection
PACOPS	Pacific Air Force Operations
POL	Petroleum, Oil, and Lubricants

RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer
RH	RED HORSE
RRR	Rapid Runway Repair
SB	Standby Base
TA	Table of Authorizations
TAC	Tactical Air Command
TAF	Tactical Air Forces
TPFDL	Time-Phased Force Deployment Listing
USAFE	United States Air Forces, Europe
UTC	Unit Type Code
WRSK	War Readiness Spares Kit

Abstract

RED HORSE (RH) units cannot quickly deploy under current guidelines. The problem is mostly the incompatibleness of operational guidelines with modern constraints. Solutions exist in theory, but predictions of success must involve changes in deployment planning, the current "buzz word" being "force module" applications. This study defines the criteria for RH force module applications. This approach should bring about a more responsive deployment capability by way of well developed planning.

Research included reviews of historical documents and past studies such as RELOOK. Experts were surveyed to develop additional data in support of criteria development. The survey process was accomplished as a Delphi study which is a data collection procedure for refining the opinions of experts. The Delphi process normally involves several iterations of expert interviews with the goal of reaching a consensus among respondents.

Twenty experts were selected, but only nine participated. Fortunately, nine is an acceptable sample size for Delphi processes. A consensus of expert opinion was reached on most of the questions pertaining to criteria development.

Results suggest basing force module criteria on multi-attribute and multi-objective decision making. Many of the criteria were defined while analyzing such attributes as survivability and responsiveness under given constraints. The criteria aim towards optimal balance of capability and responsiveness in the framework of combat support doctrine. Some of the broadly defined constraints include geography and economics. Recommendations include applying this decision framework to a quantitative decision analysis technique.

Additionally, the results indicate RH modules can be modified or scaled down without significant impacts to heavy repair capability. The recommendation is to first identify the incremental relationships between heavy repair capability and quantities of people and equipment.

IMPROVING THE DEPLOYING CAPABILITIES OF RED HORSE (A FORCE MODULE APPROACH)

I. Introduction

Overview

This chapter discusses the background of this research effort. This thesis examines the problems affecting the rapid response capability of Air Force Civil Engineering (AFCE) combat units which are better known as RED HORSE. Specifically, the chapter is divided into seven areas: (1) general issue, (2) definitions, (3) research problem, (4) research objectives, (5) assumptions, (6) scope, and (7) background.

General Issue

RED HORSE units lack the ability to quickly mobilize all of their personnel and tactical equipment under current operational guidelines (36). The problem is caused by several factors one being the incompatibleness of existing operational guidelines and resource taskings with modern constraints, that is, ". . . the gap between mission requirements and capability . . ." (36). During the past 4 or 5 years, several initiatives have been underway to improve the deployment capability of RED HORSE units. For

example, the RED HORSE RELOOK study--of 1985 to 1986--tested several options of UTC (unit type code) configuration. Unfortunately, this researcher is not aware of any successful initiatives.

There are several active, guard, and reserve units located in the CONUS, Pacific, and European theaters. Each unit has tried several techniques to improve deployment capability but all have been unsuccessful due to restraints presented by a 17 year old concept which forces them to mobilize under standard procedures for all RED HORSE units (14). Unfortunately, the mobility requirements of theater based units are actually quite different from CONUS based units. The location of each unit produces unique requirements which impact strategic planning, prepositioning requirements, and transportation availability, all of which directly influence deployment capability. Furthermore, changes to equipment and vehicle authorizations have made it difficult to deploy RED HORSE and still meet departure times specified by AFR 93-9. These are some of the concerns the Air Force recently began to address with the formation of a TAF (Tactical Air Force) RED HORSE Steering Committee (36). The committee has addressed a force module deployment concept. Force modules should aid quick reaction capability by providing improved response under notional taskings where various force mixtures are required. Force modules should be an efficient tool for crisis planning.

Definitions

Deployment capability has many connotations and is also commonly discussed by other military units and services. Thus, the meaning of certain terms must be specified to prevent ambiguous interpretations of the concepts. The following definitions were derived from both the Department of Defense Dictionary of Military and Associated Terms and discussions in references cited.

Contingency Support Operations. Actions which are required to aid, protect, complement, or sustain other forces. Actions should be based on reasonable anticipation of the enemy threat.

Deployment Capability. Quality associated with the ability to move forces to desired areas of operation.

Force Module. Group of combat, support, and service support forces (with supplies) for a specified period, usually 30 days. Elements of force modules are combined or separately identified to allow easy adjustments in the TPFDD (Time-Phased Force and Deployment Data) which adds flexibility to crisis planning (1). For this research, force modules shall not be solely dependent upon operation plans or plans used in deliberate planning.

Heavy Repair Capability. Quality associated with the ability to restore heavily damaged facilities, utilities, and pavements to serviceable condition. Usually requires large earth moving capability.

Notional Tasking. Orders based on quick, careful contemplation, and theoretical speculation of required objectives. Orders are usually the result of crisis planning and are translations of the assignment of expected effort in various geographic areas for a given period.

Specific Research Problem

This research addresses specific deployment capability issues of RED HORSE units and recommends criteria for changes to the current concept of mobility procedures (for contingency support operations) in RED HORSE. In their first meeting minutes, the TAF RED HORSE Steering Committee identified the issues and problems with RED HORSE mobility, specifically, the inability to quickly deploy (36). This study attempts to address the following concerns: Can RED HORSE teams be modified to reduce the amount of necessary equipment without detriment to heavy repair capability? What factors should be considered to achieve a balance between heavy repair and rapid response?

Research Objectives/Investigative Questions

In addition to addressing the two concerns mentioned above, the objective of this research is to define the criteria and standards for force module applications in RED HORSE. Ideally, a well developed force module approach should lead to a feasible concept of operations (for

contingency support) that would bring about a smoother, more flexible, and more responsive deployment capability for RED HORSE. The researcher will attempt to meet this objective by analyzing the current mobility team structures--in view of force module applications--assuming other policy related actions such as prepositioning are acceptable. The following questions guided the research effort:

1. What were the early considerations or factors used in determining the original support requirements and team composition in RED HORSE?

2. What are some specific problems which have impaired deployment capability?

3. What techniques were employed in past attempts to improve deployment capability?

4. What are current recommendations for improving deployment capability?

5. What techniques are other military branches using to deploy similar combat engineering units?

6. What relevant planning factors are crucial to tailoring a RED HORSE deployment?

7. How does the heavy repair mission relate to mobility requirements for RED HORSE?

8. What are possible combinations of personnel and equipment that will improve the current response capability of RED HORSE while still meeting mission requirements, that is, revised force modules?

Assumptions

Several assumptions were made to analyze the feasibility of force module applications in improving RED HORSE deployment capability; they are:

1. Changing the mission of RED HORSE is beyond the scope of acceptable (politically acceptable) solutions to the problems associated with deployment capability.

2. The doctrine of AFCE and RED HORSE will not change significantly during this study.

3. Prepositioning of various equipment and supplies for RED HORSE is possible if supported by Air Force leadership and funded by the Department of Defense.

Scope and Limitations

Due to the nature and scope of this study, a detailed analysis of problems in each unit cannot be accomplished. Therefore, the greater part of this research effort focuses on the problems of those units which are located outside of the continental US. Special attention was given to the problems of the RED HORSE unit located in Korea, the 554th RED HORSE Civil Engineering Squadron (RHCES). The 554th is the unit which has recently stimulated the greatest amount of concern at major command level and higher. Also, recent literature and experience make the unit an excellent case study example to support the research. Even more, this is the only unit in which the assigned MAJCOM (major command) Directorate of Engineering has explicitly requested that TAF consider redefining the mobility team concept for RED HORSE. Obviously, answering the first few research questions requires a generic analysis of RED HORSE operations as applied to all units and as such, this was performed.

As in the case with studies on the history of warfighting aspects of AFCE, one research constraint is the lack of abundant and detailed documentation on RED HORSE

development and problems. However, the data provided in other student theses suggest the available sources may be sufficient to answer the questions.

The most significant limitation is the lack of well documented data that might be used to develop standards for force module applications in RED HORSE. The force module concept is relatively undeveloped for RED HORSE application. The concept was partially tested in 1984-1986 at the 823rd RED HORSE Civil Engineering Squadron under a program called RELOOK (42). RELOOK is discussed more in later chapters. Events such as the RELOOK study proved that the force module concept is one not readily accepted by the Civil Engineering Community. Consequently, surveys, questionnaires, and interviews were carefully planned to filter distortions from personal biases and political pressures.

Background

Current Concerns for RED HORSE. Some of the problems with RED HORSE have already been uncovered in the early exploration stage for this study. Most of the information was obtained through unstructured interviews with several members of the TAF RED HORSE Steering Group Committee.

The first meeting of the RED HORSE Steering Committee was held on 11 December 1987 at Eglin Air Force Base, Florida. The briefings that took place at that meeting centered around several aspects of RED HORSE operations: (1) RED HORSE's inability to move quickly, (2) need for

strategic placement of RED HORSE units, and (3) prepositioning of equipment and materials. "They [the steering committee] concluded that RED HORSE is seriously impaired by the lack of timely deployment capability and the [non-] availability of prepositioned assets to satisfy mission requirements" (36).

The minutes of the first steering committee meeting listed the following as some of the current RED HORSE issues (relevant to this study):

1. Must analyze threat and existing infrastructure.
2. Must have theater identified wartime tasks and projects.
3. Must better define host nation support.
4. Must better describe equipment needs and users.
5. Refine concepts of operation for RED HORSE.
6. Reassess manpower capabilities and force composition.
7. Develop a standard planning method for each theater of operations.
8. Develop equipment and force module approaches to improving quick reaction capability (36).

Summary

This research involves the deployment capability of RED HORSE. Senior leaders in the Air Force are concerned about the inability (of the Air Force) to quickly mobilize and deploy RED HORSE units. The problem has taken some time to mature, but it is important that one does not view it solely as a unit responsibility. The units have tried various

methods to improve deployment capability, but have found little success. This chapter has highlighted the general problem, objectives, scope, and limitations of this research. The background in this chapter provides the current issues of RED HORSE deployment capability. The background also adds more impetus to the concerns of threat analysis, force requirements, and flexible planning.

Chapter 2 provides more of the necessary background information. Specifically, the discussion includes the mission and operations of RED HORSE, the historical development of RED HORSE, and a review of past research on this topic.

II. Background

Overview

This chapter discusses the information necessary to understand why RED HORSE is experiencing problems. The chapter also provides additional guidance for achieving the objectives of this research. To understand the problems, one must know how the problems came about and that requires a knowledge of the RED HORSE mission and development. Even more, in the usual problem solving process, a common framework helps to describe the solutions. This research presents AFCE doctrine as a potential framework for the findings, recommendations, and conclusions.

The results and methodologies of past research on deployment capability helped to provide guidance and structure to the research effort. The only comparable past research that could be found was done by Major James T. Ryburn who was also a major player in the RELOOK study.

Mission

The mission of the 554 RHCES, which is fundamentally the same as the mission of all other active RED HORSE units, is as follows:

> A RED HORSE squadron performs heavy damage repair required for recovery of critical Air Force facilities and utility systems required for aircraft launch and recovery that have been subjected to enemy attack or to natural disaster; accomplishes required engineering support necessary for beddown of weapon systems, and the installation of critical utility and support systems required to initiate and sustain operations, especially in austere, bare base environments;

provides, in peacetime, an engineering response force that can support special operations such as an aircraft crash or a nuclear weapon accident recovery in remote areas or can operate contingency airfields in remote areas or operating locations required by Joint Chiefs of Staff missions; and is manned, equipped and trained to conduct heavy engineering operations as independent self-sustaining units (with resupply of consumables) in remote hostile locations. The primary objectives of the RED HORSE program are to develop and maintain a highly skilled, mobile, self-sufficient Air Force combat engineering force capable of rapid response and independent operations to support contingency operations worldwide; provide supplementary training to make sure that Air Force RED HORSE military personnel are able to perform direct combat support tasks including unique engineering capabilities maintained only by RED HORSE squadrons and develop and maintain Air National Guard (ANG) and United States Air Force Reserve (USAFR) RED HORSE forces for direct combat support (50).

The important goals mentioned in the above mission statement are:

1. Heavy repair for recovery of critical facilities and utility systems after attack or natural disaster.

2. Engineering support in remote areas for
   - beddown of weapon systems in austere environments.
   - aircraft crash or nuclear accident recovery.
   - operation of contingency airfields.

3. Operate as independent self-sustaining units in remote hostile locations.

4. Maintain a highly skilled, highly mobile, and self-sufficient combat engineering force. for worldwide support.

5. Provide training to maintain unique capabilities.

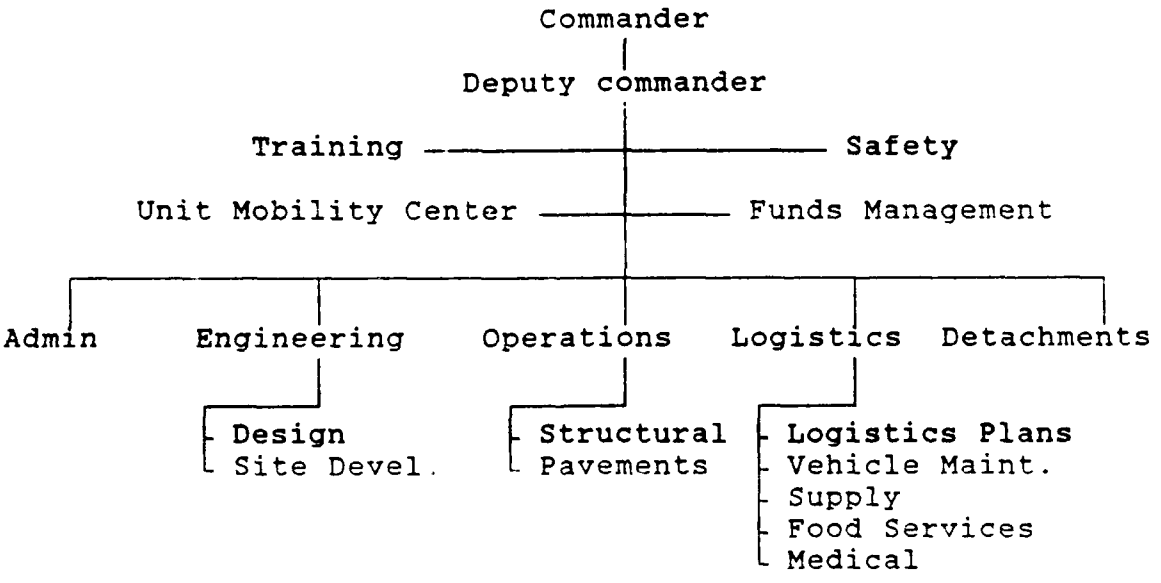
Organization

This section focuses on the internal organization of RED HORSE as it relates to mission and more importantly, the

deployment capability. In actuality, RED HORSE has two coexisting organizational structures, one for peacetime (or day-to-day) operations and the other for contingency operations. One could say there is truly only one organizational structure similar to a matrix organization. The matrix gives RED HORSE the internal command and control necessary for rapid response to contingencies.

The peacetime organization is shown in the figure below.

Figure 1. Peacetime Organizational Structure



(14)

For mobilization planning, the contingency structure of RED HORSE consists of three echelons, RH-1, RH-2, and RH-3. In force planning documents (such as the Air Force War and

Mobilization Plan, volume 3), each echelon is recognized as a separate UTC with separate personnel and equipment requirements (14).

RH-1 is 16-man unit which determines the advanced engineering requirements for regeneration of RED HORSE forces and the beddown of other incoming forces. The Chief of Engineering is the RH-1 team chief. RH-1 should be air transportable and capable of performing airfield surveys, base development planning, and materials requirement planning. RH-1 should also be deployable within 12 hours on initial notification to deploy (14).

RH-2 is a 93-man unit which is the smallest RED HORSE force module to contain heavy repair capability. The Squadron Vice Commander is the team chief. RH-2 should be deployable after 48 hours and its mission includes:

1. Land clearing, site stabilization and area drainage earthwork essential to force beddown at an undeveloped location.

2. Erecting Harvest Eagle, Harvest Bare, and other temporary relocatable facility substitutes required for force beddown.

3. Performing rapid runway repair.

4. Repairing bomb-damaged facilities and systems using field expedient methods and available materials.

5. Installing or expanding and repairing essential utility systems to support force beddown, including airfield lighting.

6. Installing expeditionary aircraft arresting barriers.

7. Providing initial civil engineering support, except fire fighters, to deploying forces.

8. Constructing water wells as necessary to meet deploying force water requirements.

9. Performing explosive demolition operations as required heavy bomb damage repair, erecting basic shelters (14).

RH-3 is a 295-man unit which possesses the greatest amount of heavy earth-moving equipment and shop tools. The Squadron Commander is the team chief. RH-3 should be deployable after six days and its mission includes:

1. Accomplishing heavy repair of bomb damaged facilities and utility systems.

2. Erecting Harvest Eagle, Harvest Bare, and other temporary relocatable facility substitutes required for force beddown.

3. Installing essential utility systems to support force beddown, to include airfield lighting.

4. Operating mineral products plants (crusher, batch plants, block plant) if required, when plant equipment not normally included in peacetime equipage is supplied.

5. Performing explosive demolition operations as required.

6. Operating independently of base operating support if consumables are resupplied.

7. Performing rapid runway repair (14).

Historical Development (9)

Air Force Civil Engineering RED HORSE squadrons have faced role identification and mobility difficulties since the end of the Vietnam War (44:Abstract). This is a significant problem for Air Force Civil Engineering because RED HORSE units are the only combat-heavy construction and repair capability of the United States Air Force.

A deeper analysis of the problems (impairments to operational capability) of RED HORSE is gained by understanding both the development of the AFCE contingency support capability and the problems with civil engineering doctrine. Why should the development and doctrine be included as important background information to a study on current problems with mission capability of RED HORSE? The answer is simply to make effective improvements to mission capability one must first understand the mission. Gaining a complete understanding of the mission of RED HORSE requires an analysis of the development of combat support and contingency response capability in the context of AFCE. The doctrine of AFCE will guide the problem solving effort and will also be the framework for presenting solutions. The next few pages of this study provide a concise view of the development of AFCE contingency support capability and the unofficial civil engineering doctrine -- with relevance for the study of current RED HORSE problems.

AFCE history suggests since the Air Force became a separate military service in 1947, the engineering support capability for Air Force contingencies has been suspect. With the creation of an autonomous Air Force, the Army engineers were given total control of the engineering functions responsible for contract and troop construction support to the Air Force. At the end of the Korean War, the Secretary of Defense increased the Air Force's

responsibility to only minor base level maintenance and repair (41:191). Part of this decision specified that the Army would remain the contract and troop construction agent for both services (2:34). One reason for giving some responsibility and control to the Air Force was that the Army heavy construction battalions did not support the Air Force well during the Korean War.

Not long after the end of the Korean War (in 1958), the Air Force Civil Engineering organization was tasked to support a build-up of forces in Southwest Asia (41:191). Unfortunately, AFCE was not prepared; they had no plan or procedures to deploy forces for airbase operations in foreign countries. Fortunately, they were flexible enough to organize a plan which involved pooling their own organic repair capabilities to create mobility repair teams. "This plan was called the Civil Engineer Mobile Team Concept" (2:37). The mobile teams provided USAFE (US Air Forces, Europe) with the capability to rapidly respond to contingency situations anywhere in the European theater (41:195). As this study will later show, this concept of rapid response for mobilization is a key aspect of the civil engineering wartime capability and a key criteria of the RED HORSE mission. Two important aspects of the Mobile Team Concept were (1) plans to establish support agreements with host countries thus defining types of expected support and (2) organization of modular mobile teams which could be

deployed to "... hot-spot locations and operate air bases in an emergency" (2:37). The following guidelines were used in structuring the mobility teams:

1. Constructing teams of limited size by taking Airmen from available USAFE resources.
2. Ensuring "detachable cells" existed with the team structure to provide limited operation and maintenance capabilities.
3. "The entire team would function only in support of essential operation and maintenance."
4. The Army would continue to provide heavy construction capability.
5. The teams would possess quick response and deployment capabilities.
6. Teams would augment in-garrison engineering work forces and would be augmented by other teams as appropriate (2:37).

In 1961, the Air Force was again called on to support a force build-up, this time in Europe. The tasking for AFCE was to provide support for the beddown of deployed forces. The challenge for AFCE was to quickly mobilize the recently formed mobility teams and create plans to handle the 1200 percent increase in facility requirements (2:38). Unfortunately, AFCE had not been given the responsibility nor the resources to handle the task alone. The AF greatly needed Army and contractor support. Unfortunately, the Army could not support the Air Force; instead the Air Force relied heavily on contractor support. AFCE, with help from

contractors and host nation laborers, was able to "... avert what could have been a dismal failure of reinforcement strategy" (6:7).

Prime BEEF. In 1963, a joint Civil Engineering and Manpower study paved the way for the development of a new civil engineering mobility structure. This structure would improve the mobility and combat support capabilities of AFCE mobility teams. The study pointed out the deficiencies of not having organic contingency response capability within AFCE which also correlates with the problem of relying on the Army for construction support. The concept was called Prime BEEF (Base Engineer Emergency Forces). The improvements of this concept over the old were: (1) better force structure alignment for improved command and control and training, (2) standardized team modules, (3) prepackaged tool kits, and (4) designated team composition for minimum repair capability (2:40-42). The Prime BEEF concept translated into a major improvement of AFCE contingency support capability. However, AFCE still lacked in-house, combat-heavy repair capability.

Vietnam Era and the Creation of RH. In 1965, the first Prime BEEF teams deployed to Vietnam. These teams constructed many fortifications for aircraft parking and also constructed living quarters for 4900 arriving airmen (2:50). Every 120 days a new Prime BEEF team arrived to replace the old. By August 1965, the rotating Prime BEEF

teams completed construction of major sewer, water, and power distribution systems. Each Prime BEEF deployment proved successful and gained enormous attention from military and congressional leaders (2:51). Although the program seemed successful, AFCE leaders recognized they were not keeping up with rapid increases in construction commitments caused by the escalating force build-up. AFCE did not possess the capability to rapidly construct the additional airfield pavement for parking to support the huge influx of aircraft. Also, new airbases were required to relieve overcrowding at existing bases (51:28). AFCE desperately needed help and that help would come not from the Army but from the Navy.

The Navy operated as the contract construction agent in Vietnam and was thoroughly familiar with construction contracting requirements in Vietnam. The Navy aided AFCE by contracting support from two US contractors (40:3). However, the Secretary of Defense, Robert McNamara, and the Secretary of the Air Force, Harold Brown were concerned with the fact AFCE did not possess the capability to rapidly construct and repair airfields. As a result of this concern, AFCE leaders decided to develop that rapid response capability (51:28). In 1965, AFCE organized two 400-man heavy repair squadrons. These squadrons were called RED HORSE.

Initially, RED HORSE supplemented the Navy's contracted airfield construction efforts (40:4). As time progressed, RED HORSE became involved in the construction of hardened shelters, modular facilities and other mission essential facilities (2:67). Together, the Prime BEEF teams and RED HORSE squadrons were successful. Eventually they were phased out of Vietnam as US involvement decreased.

AFCE Doctrine

A student thesis quotes General Curtis Lemay as saying:

> "At tne heart of warfare lies doctrine. It represents the central beliefs for waging war in order to achieve victory. Doctrine is of the mind, a network of faith and knowledge reinforced by experience which lays the pattern for the utilization of men, equipment and tactics. It is the building material for strategy. It is fundamental to sound judgment" (51:1).

A more fundamental description of doctrine is the "... principles by which the military forces or elements thereof guide their actions in support of national objectives" (11). Moreover, military doctrine is derived through knowledge which has been accumulated from past events, previous demonstrations of armed conflict tempered with political influences.

The AFCE organization lacks any formal documentation or pure philosophy which describes its doctrine. Why does this deficiency exist? One reason is that until recently (within the last three to five years), there was little effort and desire to analyze the historical significance of AFCE's role for combat support in the spectrum of warfare from low

intensity conflict to conventional (general) warfare. It is in these experiences we would hope to find sound military practice and proven concepts on which to base operational doctrine. Another reason for this deficiency is the inability to define a doctrine consistent with both the wartime and peacetime missions of AFCE. This researcher believes the nonparallel growth of the two missions presents an even tougher barrier to developing effective doctrine.

The lack of operational doctrine (or lack of clearly defined concepts of operation) caused AFCE leadership to "reinvent the wheel every time our nation went to war, especially in the post-Second World War (WW II) era" (51:2). The Vietnam War is good example; if the AFCE leaders would have fully integrated lessons learned from previous wars into doctrine (with anticipatory guidelines) for force beddown and combat support, many of the airbase construction problems would have been thought of and perhaps solved before the deployment of engineering forces.

Doctrine "... is the foundation on which CE [AFCE] logically builds its strategy and tactics" (31:8). As proven by history, success in combat depends heavily on doctrine.

Although AFCE has no formally approved doctrine, there is an informal doctrine which is suggested by the civil engineering directives and regulations. "AFCE practices informal doctrine, for example, by building for over two

decades on a wartime force characterized by mobile engineer teams" (39:12). The informal doctrine does provide the necessary concepts on which to base operations, but there are some shortfalls. The informal doctrine of AFCE has neglected to include lessons learned from past contingencies and has also neglected to recognize elements of change in technology. In each of the past military conflicts, AFCE made mistakes because of these shortfalls in doctrine. In summary, some of the most common mistakes were:

1. Relying on other agencies for heavy repair and construction and not preparing alternative plans of support.

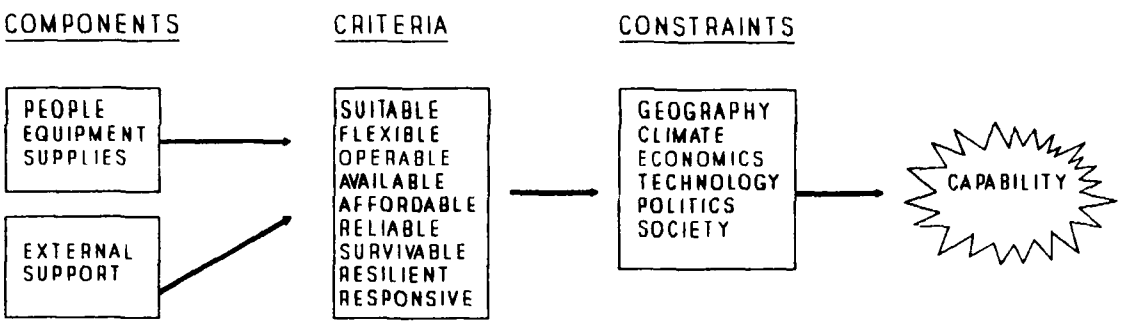
2. Not ensuring that available military construction technology was compatible with weapon systems to be supported.

3. Not adapting or producing flexible contingency plans for deployments in various geographical areas.

4. Not correctly assessing force (manpower and equipment) requirements to match required levels of combat support.

From the informal doctrine, HQ USAF has drafted AFM 2-XX, the first version of what may eventually become a engineering readiness division of Tactical Air Command formalized doctrinal statement (30). The following figure was patterned after one in AFM 2-XX. The figure shows the relationship of criteria to other doctrinal planning concepts.

Figure 2. Planning Engineering Contingency Support



Past Research and Studies

The preliminary research uncovered two studies dealing with RED HORSE force structure. One was "RELOOK", the result of a "restructuring initiative" by HQ TAC/DED (47). The other was an Air Command and Staff College (ACSC) report by Major James T. Ryburn entitled Missions and Mobility Configurations for RED HORSE (44).

The RELOOK Study. RELOOK's purpose was to develop and test new deployment modules by using the 823rd RHCES as a pilot unit. RELOOK's initial objectives were to reduce the "heaviness" of individual modules and to improve allocation of force modules by eliminating inefficient taskings and force match-ups (47:2).

RELOOK has several advantages and disadvantages compared with this and other studies. Discussions with RELOOK participants indicate RELOOK was handicapped at the onset. The timing was inappropriate because Prime BEEF was just completing its reorganization. The higher organizational (major command) influences created symptoms of group think and political conformity.

In the 1987 Concept of Operations planning conference, Brigadier General Ahearn, HQ USAF/LEE, suggested that RED HORSE operations should be comparable to the new Prime BEEF forces (32). Even though this statement was made after RELOOK, this same philosophy is believed to have affected the decisions regarding RELOOK's initiatives. At the onset of RELOOK, the Prime BEEF structure was in flux. No documented evidence has been found, but it is believed the reorganization of Prime BEEF had some influence on the decisions regarding the implementation of RELOOK recommendations. For instance, simultaneous transitions for both RED HORSE and Prime BEEF may not have been politically acceptable for senior AFCE leadership.

Another apparent disadvantage was the top-down organizational influences in planning and organizing RELOOK. "RELOOK was flawed in original concept . . .," because it was another compromise to meet various missions (44:18). RELOOK's evaluators attempted to find a politically acceptable balance between heavy repair and construction

capability and rapid response. This may have precluded the testing of other options.

The advantages in RELOOK were (1) the ability to physically test new configurations and (2) the support provided to the 823rd by HQ TAC and the AFESC. The 823rd tested several options and in January 1986 selected the one which best met the original goals (47). The option selected is listed as "option 1" in Appendix A.

A key issue regarding unit self-sufficiency was addressed in the final RELOOK report. RED HORSE has limited self-sufficiency. "RED HORSE has the ability to survive or operate, but they cannot do both simultaneously" (47:35). They do not train to be proficient at providing long term security defense in extremely hostile areas. Consequently, we must assume that RED HORSE would deploy to low threat areas, most likely a COB or MOB (47:36).

Ryburn's Research. Major James T. Ryburn's ACSC report presented a different approach to revising RED HORSE force modules. Instead of compromising between heavy repair and rapid response, Ryburn saw a need to develop a dual structure to respond to both ". . . theater [conventional] requirements and lesser contingencies while complementing the role of Prime BEEF" (44:vi). Ryburn also attempted to define a doctrine or mission statement in support of his dual mobility structure. He suggested a doctrine which accommodates (1) complementary roles of RED HORSE and Prime

BEEF, (2) differences in crisis and deliberate planning, and (3) differences in low intensity conflict and theater conventional warfare (44:vi).

Ryburn's methodology included a review of historical reports and regulations, an analysis of current and suggested configurations, and interviews with contingency planners.

Ryburn concluded that RED HORSE should operate around a dual structure which supports both (1) theater plans based on prepositioned assets and (2) specific taskings for contingency response. His recommendation is listed as "option 2" in Appendix A.

Summary

Obvicusly, RED HORSE was created to give the Air Force organic heavy repair and construction capability, thus reducing its dependence on other agencies. This chapter touches on the creation of RED HORSE and its role in the larger AFCE mission and doctrine. RED HORSE was created out of the needs of Vietnam. Its structure was designed to support those needs but also given the same characteristics of the earlier mobile teams.

The organization, as discussed in this chapter, is what is used today. The current structure is the result of numerous changes since the Vietnam era. This structure is discussed in more depth in the next chapter.

The discussion on doctrine presented a few common

mistakes or problems which still plague AFCE. These four problems may not be the antecedents of RED HORSE deployment concerns but they do seem closely related.

AFCE is working to solve the problems, but unsuccessfully to this date. Various studies have addressed the problems with doctrine and with deployment capability. Each approach differs slightly, but their importance lie in the exploration of alternatives.

III. Literature Review

Overview

T e purpose of this chapter is to identify, develop, and investigate additional data supporting the analysis in remaining chapters. This chapter also focuses on the important research issues with regards to the 554th RHCES. The discussion also partially covers how the current RED HORSE structure was designed. It also covers the mobility processes of RED HORSE, factors which inhibit deployment capability, and potential solutions identified in the literature.

Designing a RED HORSE Module

Historical Perspective. Earlier discussions revealed that RED HORSE was designed to provide the AF a heavy repair and construction capability in Southeast Asia. (The key word is capability.) What has not yet been discussed is how and who decided what combination of manpower, equipment, and supplies would produce that capability.

Why a RED HORSE? Before the creation of RED HORSE, Prime BEEF operated as an emergency force in Vietnam. Prime BEEF would perform expedient work ". . . until a greater construction contract effort could be programmed, funded, mobilized and put to work" (45:6). This worked fine for awhile but some recognized that this was not the best way to manage base recovery efforts. One major problem was

that changing requirements created a constant flux in Prime BEEF tactics, unit deployments, and force levels (45:6). In 1965, PACAF requested that HQ USAF develop a ". . . more stable and capable heavy repair and emergency construction capability based upon experience . . ." in Vietnam (45:7).

Fortunately for engineering forces in Vietnam, the AF had already initiated a study on the development of a heavy construction capability. This study was the AF's response to a classified memorandum from Secretary of Defense Mcnamara to the Secretary of the AF. Secretary Mcnamara wanted to know if the AF could develop a capability--similar to the Marines--to construct expeditionary airfields (12). As discussed earlier, two RED HORSE squadrons were created to provide that capability in Vietnam. They were not identical to the Marine or Army units, 44% the strength of Army battalions and 54% that of Navy SEABEEs; however, they did do the job for the AF (45:8).

Mission and Capability. In their study, the AF spelled out the following reasons for initially creating RED HORSE:

1. To provide bomb damage recovery beyond the recovery efforts of base's forces.

2. To support tactical force deployments [force beddown].

3. To provide (in 30 days) expeditionary airfields and austere facilities if Army or Navy was unable (12:2).

These three elements are the seeds of the expanded RED HORSE mission that is discussed under the section on current structure.

Having direct feedback from the Vietnam experiences, the AF obviously had a feel for what the mission of the new RED HORSE squadrons should be. However, they were still left with determining the actual force composition. No documentation was found to verify how the RED HORSE designers came up with the manpower and equipment breakout for the 400-man units. However, it is safe to assume that these units were modeled after the Army and Navy battalions. Documentation on the AF's study does say that manning requirements were developed based on planning factors from Army manuals and "empirical factors provided by field test" (12:4). Requirements were also based on the need for certain capabilities such as:

1. An engineering staff to plan work.
2. Advanced airfield survey teams.
3. Expedient bomb damage repair based on a 20-hour work day.
4. Expeditionary airfield construction.
5. Beddown of 1000-man force.
6. Utility system construction.
7. Well drilling.
8. Rapid runway repair using AM-2 matting (8-hour work day.
9. Ability to perform field maintenance on vehicles.
10. Mess and dispensary operations.
11. Ability to move by air and convoy.
12. Overhead personnel for administration, supply, and costing.
13. 90-day [intra-theater] deployment capability.
14. Barrier installation capabilities.
15. "Capability to deploy "blocks" [sic] of skills for specific tasks . . ." (12:atch 1).

This long list of capabilities obviously indicates the designers wanted RED HORSE to have much more than just heavy repair and construction capability. They wanted the units to be mobile, deployable, and self-sufficient (to a limited degree). These three qualities are discussed in greater detail in succeeding paragraphs.

Of the fifteen capabilities listed above, the principal concern of senior leaders was the AF's ability (or lack of) to construct airfields. Although one of the reasons for creating RED HORSE was to provide the AF the capability to construct expeditionary airfields, the squadrons were "manned and equipped principally for vertical construction of combat theater standards" (45:8). The AF explicitly stated that units could not perform semi-permanent and permanent airfield construction (12:atch 1).

Mobile and Deployable. This researcher believes a distinction is implied in the definition of "mobile" versus "deployable." The designers most likely wanted the units to be mobile in the sense that units could quickly and effectively dispatch blocks of skills to respond to emergencies within the theater of operations. For instance, they probably meant that work party teams should be able to quickly convoy to construction sites. The designers probably intended RED HORSE to be deployable in the sense that units could quickly and effectively prepare packages for deployment to areas that were most likely beyond the

effective range of command and control for the units. Deployed elements would operate independently under regional command and control for either inter- or intra-theater deployments. This inference about the intended differences between "mobile" and "deployable" is based on readings of several RED HORSE squadron unit histories. It appears that the units were intended to be mobile for ground deployments, but at the same time, in-garrison units were to be easily deployable to other areas of operations, either by air or surface. However even then, the designers knew that RED HORSE was not fully suited for airlift. They knew that some equipment would be too large for available cargo aircraft. They also estimated that 105 C-130 loads were required to move the 977 tons of equipment and supplies (12:atch 1). The possibility of dedicating this amount of airlift to RED HORSE was and still is low.

Self-sufficient. The units were also intended to possess limited self-sufficiency. Thus, they would possess certain capabilities that would allow them to deploy entirely or as smaller portions, being able to operate independently (for 90 days) in both states with little support from outside. The units would be given their self-sufficiency through their logistics functions: vehicle maintenance, messing, dispensary, and supply.

Another aspect of self-sufficiency is the ability to provide active defense in hostile environments. In their

study, the AF stated that RED HORSE units could not perform base perimeter security (12:atch 1). The initial plan was to provide security police augmentees before deploying RED HORSE to a hostile environment (19:2). However, past unit performance contradicts earlier opinions of RED HORSE's ability to provide active defense. In Vietnam, at times RED HORSE had to provide its own security and during the Tet offensive some RED HORSE personnel operated as security police augmentees (49:10).

Deployment Structure. The earliest dated evidence of any particular deployment structure was found in AFR 93-9, 13 March 1972. There were three echelons identified: CES-1, CES-2, and CES-3. These three are similar to the three that exist today. Respectively, their designed response times were 12 hours, 72 hours, and 10 days after notification (18:8). CES-1 and 2 were to be deployable by air or surface. CES-3 was to be deployable only by surface (18:8). The regulation also stated that personnel and equipment should "remain in close proximity" to the squadron location to meet the designated response times (18:6).

Where did this three echelon system originate? An interesting coincidence is the three team system that was used to backfill and train personnel for forward deployed units in Vietnam. Before the first units were sent to Vietnam, all personnel were trained as a unit at one location (49:5). Due to the one year rotation policy,

leaves, sickness, and other problems, the AF had to come up with a plan to provide trained personnel to backfill the existing units. The Air Force evertually decided to divide the units into three increments. Personnel were replaced by rotating the increments, each one month apart; the increments were called "advanced, first phase, and second phase" (49:5). Speculation might lead one to believe this three tier rotation policy became the basis for the three module deployment structure.

Again, no evidence of a particular structure before this regulation has been found. However, based on readings of unit histories, from 1967-1969, it may be safe to assume no particular structure existed until the 1972 draft of AFR 93-9. Before then, units seemed to have deployed modules that were appropriate to the taskings.

In 1975, AFR 93-9 was updated but except for a few changes to skill, the overall configuration (force structure) was essentially unchanged (13). The updated regulation did contain new designations for the use of RED HORSE force modules. However, this may have been due to refinements to the AF mobility planning process, such as automation in resource planning. The modules were identified as UTCs and their capabilities were strictly defined.

Another Proposal. In earlier years after its creation, RED HORSE did not to have the ability to develop

semi-permanent and permanent airfields. They lacked sufficient equipment such as rock crushers and concrete and asphalt batch plants (16:4). One proposal made to resolve this and other problems was to develop 200-man augmenting squadrons (16:5). The 200-man units would operate in two ways: 1. as a self-sufficient unit capable of accomplishing smaller projects; 2. as an "integral part" of a group [of several squadrons] but capable of operating an engineering equipment depot (16:5). Another interesting aspect of this proposal was that the 200-man unit, not the 400-man unit, would contain the heavy equipment necessary for airfield construction. This would obviously make the 400-man unit lighter and more deployable. The augmenting unit would also be responsible for preparing the equipment of both units for deployment (16:6). On the front cover of the proposal was a note that said the proposal was never implemented. Even so, the RED HORSE regulation, AFR 93-9, did at one time refer to the operations of a 200-man unit (14). These 200-man units were to be CONUS based and were to be backfilled with Base CE forces when deployed (4:37). This concept is not in the current regulation. However, simply the inclusion of this concept in past regulations indicates this idea was considered feasible at one time.

Lessons Learned. Several reports including a Corona Harvest report were put together to compile the lessons learned from the use of RED HORSE in Vietnam. These

reports discuss issues that should be considered in the design of future RED HORSE modules. One important issue is the negative impact of dispersed operations on unit effectiveness. In future applications, the dispersion of RED HORSE units will most likely be a function of theater Oplans. The authors of the Corona Harvest report specifically stated that planning should be based on intra-theater movement and the use should consider unit integrity to avoid dilution of effectiveness and mobility (21). Units could not operate effectively if they were tasked with too many deployments or if too many deployed elements existed at one time. No reference was made as to what would be an appropriate number or use of deployed elements. They did note that advanced parties were critical to effective use of deployed forces (21). Advanced parties minimized the time it took deployed elements to achieve mission capability following a relocation.

The availability of air transportation is another issue raised during Vietnam that is also a problem today. Intra-theater transportation was a problem then because of the low priority given to RED HORSE forces. The planners noted that but they also noted that all air transportable assets should be designed to intra-theater capabilities (21).
Mission and command relationship also became big issues

during the Vietnam War. The following quote from Colonel Joeseph M. Kristoff, 1st CEG Commander (1969), sums it up best.

> "In answer to the critics who say that RED HORSE units should be integrated with other base units, I submit that this kind of integration is contrary to the entire philosophy of RED HORSE as a fully mobile and self-sufficient unit. To accomplish its given mission, it must retain a degree of autonomy. When these units deploy to the field, leaving the home base, let's say, they do work together, live together, play together, if you will, and a comradeship develops which is quite similar to some of our tactical fighting units. I certainly would not do anything to detract from this kind of unit integrity" (17:43).

Current Structure

The previous section provided background on how and why RED HORSE force modules came to exist under the current structure. The goal was to analyze the early considerations used in determining team composition. This section focuses on the issues surrounding the current structure. The goal here is to develop an understanding of current capabilities and current problems with the existing force structure.

Mobility Processes (9). RED HORSE mobility processes may be categorized under three phases: deployment, employment, and redeployment. Although this research focuses on deployment capability, force module analysis requires consideration of all three phases. The planning and execution of each phase have an impact on all others. Instances occur where employment scenarios greatly affect deployment planning. For example, crisis planning or

notional taskings for RED HORSE may differ considerably between employment for bare base operations in an austere environment versus employment for expedient construction or repair at a MOB. Bare base operations would most likely require deployment of all three UTCs, whereas expedient construction at a MOB may require deployment of smaller modules to provide limited horizontal and vertical construction capability. The smaller modules might be greatly reduced versions of RH-2 and RH-3 and would probably require less strategic lift.

Deployment. There are not nearly enough RED HORSE units to forward deploy them where they could provide "on the spot" support for AF world wide contingency operations. Based on the estimated theater requirements, more than a dozen RED HORSE units are needed (38). Due to this, and limited heavy engineering support from other services, RED HORSE units must be ready to provide their capability when and where (air bases are) needed. Translated, this means a worldwide deployment capability to support civilian contingencies and the spectrum of armed conflict from low intensity to theater conventional warfare.

AFCE leadership is concerned about the timely ability of moving RED HORSE squadrons [400 men and 1300+ tons of equipment] to the theater of operations (36). Granted a method or process exists on paper; unfortunately, the process is burdened by insufficient strategic lift. The

next few pages examine "getting RED HORSE to the war on time" and some of the constraints existing in this process.

Prior Preparation. The need to have available in-garrison forces for deployment places a significant constraint on the operations of the 554 RHCES. The peacetime day-to-day operations of RED HORSE are dedicated to training for their wartime missions. Training is accomplished by completing various repair and construction projects throughout the theater. Personnel are often TDY to accomplish training projects. In many cases, people are TDY more often than they are at their home unit. This translates into about one-quarter to one-third of the unit TDY at any one time.

The frequency and durations of individual TDYs make it an extremely rare event for overseas units, such as the 554th, to have enough personnel at home station to completely build RH-1 and RH-2 mobility teams without major substitutions or shortfalls. So, requirements for rapid mobilization make it difficult for a timely reconstitution of the unit before deployment. Usually, this constraint requires a certain number of personnel be designated as belonging solely to RH-1 and 2. These designated personnel are not allowed to work at locations that would preclude rapid deployment of the first two echelons. The same concept also applies to any equipment that might be required for deployment of the first two echelons. Not surprisingly, this policy was also used

by units in Vietnam. Referring back to the discussion on earlier RED HORSE units, this policy was in the regulation governing the Vietnam units. The 554th has adopted this policy (without it being in the current AFR 93-9) because of the negative impact numerous TDYs have upon deployment effectiveness.

Procedures. The following procedures are required for mobilization of RED HORSE:

1. Recalling and processing personnel and equipment.
2. Preparing cargo for shipment.
3. Marshalling and manifesting cargo (14).

The objective of mobilization is to prepare forces for military operations, and in the case of RED HORSE, to prepare for deployment by ground, sea, or air. Since deployment by air carries the most stringent preparation requirements, it is regarded as the standard, unless tasking orders specifically state otherwise. Current guidelines require RED HORSE to be capable of deploying (ready to load on the aircraft) by the following times:

RH-1 -- 12 hours after deployment order
RH-2 -- 48 hours after deployment order
RH-3 -- 6 days after deployment order (14:C2).

HQ PACAF increased the 554th's response time to 30 days for RH-3 because of the difficulties of mobilizing RH-3 (48).

Mobilization of RED HORSE requires a great deal of pre-planning and pre-packaging. Aircraft load plans are developed in advance for deployment by C-130, C-141 and where necessary, C-5 aircraft. The prepared load plans are

based on standard Unit Type Codes and are physically tested on annual loading exercises.

Prior to transportation, vehicles and equipment must be cleaned, inspected for deficiencies, packaged and tagged for movement. This process is time consuming and requires close coordination to meet the load times. As a result, some RED HORSE units, such as the 554th on Osan AB, must "pickle" a portion of loaded RH-1 and 2 vehicles and pallets to meet the processing times (22).

Transportation. The transportation of RED HORSE was partially discussed in the section on "RED HORSE Organization." This section identifies additional factors that are indirectly related to roles and missions.

Strategic lift for RH-1 and 2 are planned for airlift, while RH-3 is by sealift. Intra-theater modes include convoy, rail, air and sea. The required response times are the same for strategic and intra-theater movement. Air movement is the primary method of intra-theater deployment followed closely by land (convoy) movement. When rapid response is not critical, sea movement is considered an option for some locations. Sea movement is the secondary method for deployment of "outsized" cargo (22). Where distances from the staging area to port are large, these units have the option of transporting cargo and heavy equipment by rail or truck.

While theater specific operations plans dictate the movement of RED HORSE forces, these plans are not entirely feasible under the realities of limited airlift. The table below gives some indication of the complexity of moving RED HORSE units.

Table 1. Echelon Quantities: Men, Equip., and Vehicles

	RH-1	RH-2	RH-3	Totals
Men	16	93	295	404
Equip. (Tons)	26	494	868	1387
Vehicles	4	63	140	207

(35)

These figures were taken from a force module study on the 554th. The tonnages provide an idea of the amount of lift required to move this unit. Even with figures such as these, much of the planning is still based on airlift deployment for the first two echelons. Unfortunately, even under unconstrained peacetime conditions the "... current echelon structure has never been deployed as designed" (44). Consequently, RED HORSE units must not lose site of reality and be ready to deploy by any and every mode available to them.

Employment. "RED HORSE units may be employed for bare base operations, base recovery, base upgrade, and similar civil engineering missions;" joint operations may be conducted with Prime BEEF, other services, and contractor forces (20). In addition, RED HORSE units may hire local nationals to complete construction work. As in past conflicts, indigenous labor may be essential to mission accomplishment. At times the Vietnam units operated with as much as 8 local national laborers for every 1 military (21).

The employment of RED HORSE forces can be logically divided into two modes of operation: regeneration and contingency support. Regeneration begins once the first deploying echelon arrives at the area from which it will operate, and ends when the deployed forces are fully mission capable. The second mode entails contingency support operations and depends heavily on the air base support requirements to include: Bare Base operations, base recovery and base upgrade.

Regeneration. Regeneration includes those operations which are necessary to achieve full mission capability after relocation of forces. The regeneration requirements of RED HORSE cover a wide range of possibilities due to potential employment missions at bare bases, limited bases, standby bases, collocated operating bases, and main operating bases (20). The regeneration requirements are also heavily based on what is needed to

achieve self-sufficiency. RED HORSE units are self-sufficient to the extent that they may be required to produce potable water, repair vehicles, provide medical care, provide perimeter and work party security and establish supply sources.

Under the scenario of a total squadron deployment to a bare base location, regeneration begins with the arrival of RH-1. The team's first priority is to provide area security for their small element until reinforcements arrive. RH-1 possesses a limited capability to defend itself. Its capability is less than an Army platoon, but more than a Prime BEEF team. In addition to security, other RH-1 regeneration priority tasks include the following in sequence:

1. Make contact with nearby friendly forces.
2. Establish communication/command and control for deployed RED HORSE forces.
3. Beddown RH-1 team.
4. Determine requirements for base recovery or beddown of incoming forces.
5. Determine availability of local supplies.
6. Develop plans to include a reception plan of additional RED HORSE forces.
7. Establish camp rules and policies (22).

RH-1 should be able to survive for five days with its deployed food, fuel and water until the arrival of RH-2 (14:C2). With RH-2 comes the capability for expanded unit perimeter security, potable water production, heavy-earth moving, vehicle repair and tent city erection. The typical RH-2 regeneration tasks include:

1. Erect RED HORSE cantonment area.
2. Establish vehicle control function.

3. Water storage/production.
4. Fuel storage/distribution.
5. Hardening and camouflage.
6. Establish security response procedures.
7. Establish work squads/procedures (22).

If consumables are resupplied, RH-2 should be able to conduct [limited] self-sufficient operations for up to 60 days until the arrival of RH-3 (14:C2). With RH-3 comes the capability to provide more permanent facilities due to the inclusion of assets such as mobile concrete mixers, asphalt batch plants and shop equipment for permanent and refined construction. In addition to the standard regeneration tasks (identified for RH-1 and 2), RH-3's tasks include:

1. Erecting shop facilities.
2. Organizing special capability teams.
3. Organizing for contingency support operations.

Normally, when these tasks are complete, RED HORSE has bedded down its organic forces and has achieved the capability to perform extensive contingency support operations.

Contingency Support Operations. As mentioned earlier, RED HORSE may be employed under a variety of field conditions. The most demanding task is probably the development of a bare base in a hostile environment.

Bare base operations can be divided into several phases: 1. initial base development (using Harvest Bare/Eagle assets), 2. operations and maintenance, and 3. sustained operations and heavy repair phase (20). RED HORSE is normally tasked for initial base development, but may be

used for subsequent phases if Prime BEEF or Army engineering forces are not available.

The tasks associated with initial operations are designed for the beddown of forces--weapon systems. The following is a "prioritized" list of typical tasks for bare base operations.

Initial Base Development:

1. Base survey/layout.
2. Install runway lights.
3. Stake out facilities.
4. Site defensive fighting positions.
5. Prepare sites for NAVAIDS.
6. Repair any existing pavements.
7. Install utility and sanitation facilities. (water, electric, showers, latrines)
8. Prepare POL/munitions storage areas.
9. Install arresting barriers.
10. Prepare aircraft parking/refueling areas.
11. Construct revetments.
12. Expand existing airfield pavements.
13. Upgrade base roads as needed.
14. Construct sanitary fill and grease pits.
15. Construct wash rack and maintenance facilities.
16. Upgrade drainage.

Operations and Maintenance:

1. Upgrade/harden facilities, example: tent floors/hardback.
2. Upgrade safety and passive defense systems.

Sustained Operations:

1. Erect permanent facilities and utility systems consistent with theater construction standards.
2. Construct additional hardened aircraft shelters.
3. Erect security fencing and lighting (20).

Special Capabilities. RED HORSE also contains special capability teams which perform the heavy repair and upgrade, heavy construction, and earth moving requirements of initial and sustained bare base operations in austere

environments. These special capabilities were mentioned earlier, but the ones that distinguish RED HORSE capabilities from Prime BEEF are:

1. Asphalt paving
2. Concrete mobile
3. Explosive demolitions
4. Disaster preparedness teams
5. Expeditionary aircraft barrier installation
6. Materials testing
7. Quarry operation.
8. Well drilling (20 and 14).

The manning positions for special capability teams are not contained entirely within one echelon (see Table 2 below). Manning is primarily split between the two operational UTCs, RH-2 and 3. RH-1 possesses two members from both the Disaster preparedness and Materials testing teams. These members provide RH-1 with additional "pre-beddown" reconnaissance capabilities.

Table 2. Special Capability Manning

Capability	RH-1	RH-2	RH-3
Asphalt Paving	-	-	6
Concrete Mobile	-	6	6
Demolition	-	10	0
Disaster Prep.	2	4	6
Exp. Barrier	-	12	0
Materials Testing	2	-	4
Quarry Ops.	-	-	12
Well Drilling	-	8	4

(14:C2)

Asphalt paving is a 6-man team possessing the capability to construct, repair, and upgrade asphalt surfaces of airfields, aprons, roads, parking, and storage areas. The team is trained to operate asphalt pavers and distributors. Concrete mobile is a 12-man team capable of operating an 8 cubic yard mobile concrete mixer for construction of small concrete pads and other small jobs. Demolition is a 10-man team capable of "constructive, destructive, and base denial demolition techniques and rock quarry operation." Disaster Preparedness is a 12-man team capable of providing detection, control, and limited decontamination in nuclear, biological, and chemical environments. Expeditionary Barrier teams are composed of 12 members and are capable of installing, operating, and maintaining aircraft arresting barriers. Materials testing teams are composed of 6 members and are capable of testing the quality of soils, concrete, and asphalt pavements; they are also trained in compaction techniques and design criteria for aircraft trafficking. Quarry Operations is a 12-man team capable of operating rock drills, compressors, rock dump trucks, crushers and screening equipment. The Quarry Operations team gives RED HORSE the capability of producing aggregate for construction. Water Well Drilling is a 12-man team capable of constructing water wells for distribution systems. The team's training includes operating drill rigs and installing well casings.

These special capabilities add to RED HORSE's ability to perform independent operations in austere environments. However, this employment concept would be useless without the other organic functions that make RED HORSE partially self-sufficient.

Self-sufficiency. Employment requirements are less complex for Prime BEEF forces than for RED HORSE because of RED HORSE's statement of self-sufficiency. The "organic equipment and convoy capability" and "organic security capability" contribute to RED HORSE's ability to remain self-sufficient (44). However, RED HORSE units are not totally self-sufficient. They must rely on other agencies for resupply of consumables. They must also rely on outside contracting functions to solicit support beyond the capabilities of local AF base operations and maintenance forces.

Those elements of RED HORSE which make it partially self-sufficient are listed with the number of personnel by echelon in Table 3 below. Vehicle maintenance is vital because of RED HORSE's dependence on 200+ vehicles. Maintenance consists of recurring, periodic, and preventive maintenance. Maintenance is performed in a shop or at the job site using War Readiness Spares Kits (WRSK) for parts. Food services use mobile field kitchens to prepare tasty food for strength, endurance and morale. Supply and warehousing personnel play a key role by requisitioning the

construction materials for construction and repair of facilities and monitoring of WRSK. The medical technicians and an augmenting medical officer are responsible for the health of the squadron, inspecting the water and food quality.

Table 3. Logistics Self-Sufficiency Manning

Capability	RH-1	RH-2	RH-3
Vehicle Maint	-	6	33
Food Services	-	6	10
Supply	-	2	7
Medical	1	1	1

(14)

Redeployment. The highly mobile, rapid response mission requires RED HORSE to be prepared for redeployment from any location. Redeployment of RED HORSE can take several forms: orders might include only special capability teams, complete UTCs, or all three echelons. Redeployment orders might call for movement to another contingency location as under the regional concept, or back to home station. Normally, redeployment occurs after the original deployment taskings are complete. However, the situation may arise where taskings may be placed on hold until the redeployment taskings are complete.

Summary of Current Problems: 554 RHCES

To introduce this section, below is a quote from an article by Colonel Harry Glaze, a past directorate from HQ PACAF. Colonel Glaze expresses current RED HORSE problems as allowed but unacceptable deterioration of capability.

> "RED HORSE is in its current state of limited capability for many reasons. The squadrons were created to perform a contingency mission during a war and we have been trying to protect this vital capability from auditors and manpower cutters. Conversely, we have allowed the IG to evaluate RED HORSE in a peacetime scenario. Current unit type codes (UTCs) have been developed, using specific manpower, equipment, and materials for wrong reasons, such as easing airlift planning requirements, and tailoring to (peacetime) inspection criteria. We have in fact, simplified airlift planning but not have encouraged realistic, rational thinking to develop the best possible employment of airlift -- we've settled into the easy solution" (27:8).

Colonel Glaze's statement was included to put the problems into perspective. There are no easy answers. Although political and fiscal constraints exist, planning should be realistic and reflect those constraints.

The Issues. The issues raised in previous sections are lack of quick and flexible response capability, limited airlift, and poorly defined concept of operations which includes limited self-sufficiency (supplies and security). Under this study, the most important issue is the contingency response capability provided through RED HORSE force modules. However, all the issues are addressed because of their relationship to the employment effectiveness of RED HORSE units.

The succeeding sections are composite views of other politically sensitive issues affecting the 554th.

Performance Under Inspection (50:xi-xii). In April and June of 1987, the 554 RHCES performed poorly under two Operational Readiness Inspections (ORI). Colonel David E. Bull, the 554th commander (at the time) attributed their poor performance to a drastic change from the traditional Pacific theater "HORSE style ORI". Before the inspections, this unit had trained and exercised primarily for mobility by convoy. Colonel Bull and previous commanders assumed that all in-theater, forward deployed units would operate under intra-theater deployment planning guidelines. This assumption made sense since Osan Air Base could not support inter-theater deployment of the two large RED HORSE modules, RH-2 and RH-3. Unfortunately, the 1987 ORIs tested the units world wide (inter-theater) deployment capabilities under a rigorously defined concept of self-sufficiency. The inspection scenario called for no mobility assistance from the host base. The conclusion made is that the poor performance of the unit was not necessarily a function of its capabilities, but rather a function of mission conflicts.

Vaguely Defined Mission. In AFR 93-9, the mission statement says RED HORSE should be able to ". . . conduct heavy engineer operations as independent self-sustaining units (with resupply of consumables) in remote hostile

locations" (14:6). The 554th and offices of HQ PACAF have long debated the issue of self-sustaining operations. Unfortunately, the 554th has suffered greatly under the vaguely defined mission. HQ PACAF assumed self-sustaining meant no host base support for deployment, employment, and redeployment. The 554th staff assumed self-sustaining operations began with regeneration (48). This meant that the host base should provide deployment support such as vehicle cleaning, cargo load preparation, and equipment processing when in-garrison manning was low due to TDYs and squadron activities at other locations. Without host base support, 190 RED HORSE personnel--based on two 12-hour shifts--are required to clean, mark, pack, inspect, load, and weigh the equipment and vehicles on all three echelons (48). The 109 personnel on RH-1 and RH-2 are not usually counted in this number because they must be ready to deploy within 12 and 48 hours. This means that at least 299 persons--of the correct AFSCs--must be available to deploy RH-1 and RH-2 (48:atch 3-1). Nearly 300 persons must remain in garrison to be ready for short notice deployments. This means less than 100 people would be available for construction at TDY locations. PACAF viewed this as a detriment to the peacetime construction use of RED HORSE (48).

Another issue involving mission is how RED HORSE units should be tasked to accomplish the designed mission

objectives. The 554th's DOC (Directed Operational Capability) statement tasks the unit according to specific theater Oplans which is consistent with the intent of AFR 93-9 (48). The concern is that the Pacific theater is widely dispersed and Oplan taskings may require the unit deploy assets for great distances. Attempting to bring scattered assets together ". . . simultaneously at a potentially hostile employment site . . . requires the control of too many variables and invites mission failure" (48:atch 4).

Heavy Deployment Modules. This problem may be a misnomer because it can be viewed several ways: 1. excess weight due to unneeded equipment and supplies, 2. limited lift to deploy needed equipment and supplies, 3. improperly planned and configured modules, or 4. any combination of all three. In any case, it becomes a resource management issue. Mission objectives require effectively use of available resources under given constraints. Simplistically, the objective is to get the right RED HORSE forces to the war on time. The resource constraints are limited RED HORSE units and limited lift.

Even if the AF had enough CONUS based units and enough sealift, the process would still be too long especially for movement of RH-3. RH-3, which is 74% of a typical unit, is a likely candidate for surface movement because of its outsized cargo. Based on the surface movement of the

equipment to port, competition for movement priority, on-loading time, surface travel time over the ocean, off-loading time, and convoy and regeneration time, it could be six weeks or more before units are operational (4:41). Another problem that has not been worked out with sealift movement is coordinating the arrival of unit personnel and drivers with sealifted vehicles and equipment.

How Should AFCE Solve The Problems?

Preceding sections discussed the relationship between mission and deployment capability. This section builds on those relationships and presents possible solutions. These relationships are further explained through the (force module) elements of mission capability. These elements--manpower, equipment, and supplies--make up the heavy repair and construction capability. The balance of those elements affects the planning and execution of RED HORSE deployments.

Past Recommendations. In RELOOK, several changes were suggested for manpower and equipment distributions. The RELOOK participants apparently believed shortfalls and excesses existed in current UTCs. For example RELOOK suggested eliminating five persons (all different AFSCs) from RH-1. The study indicated the five skills were either not needed for the RH-1 mission or their jobs could be accomplished by other persons on the team. RELOOK also suggested eliminating vehicles, such as the line truck, from

the RH-2 UTC because for ". . . most contingency situations . . . simple overhead hookups could be done with climbing gear" (44).

Major Ryburn recommended that AFCE adopt a dual structure as discussed in Chapter Two. The dual structure would give the AF the flexibility to adapt RED HORSE units to crisis planning with lighter, smaller task-oriented force modules. The task-oriented structure would be most suited for intra-theater movements and low intensity conflicts. The other structure was built around personnel only UTCs supported by prepositioning.

Ideas From Other Services.

Naval Construction Battalions (3). In 1987, the Navy reconfigured the mobile Naval Construction [Force Mobile Construction] Battalions (SEABEEs). They attempted to make the battalions lighter, reduce the "footprint," and increase the responsiveness of these units. To do this, the Navy analyzed the requirements for what was needed for ". . . contingency response in the early days after mobilization -- battle damage repair and force bed down."

The SEABEE battalions contained 764 men. Much like the AF RED HORSE units, the SEABEE modules were equipped and configured for the most demanding mission. Instead, what the AF should be doing and what the Navy did is to tailor

their deploying elements to the need, possibly task organization. The other key element of the new SEABEE force planning is prepositioning.

The task modules of the SEABEE battalions are broken down into five smaller, combined-platoon size modules. Their modules are built around the following tasks:

1. RRR -- three 60-man platoons
2. Utility damage repair -- three 120-man platoons
3. Structures damage repair -- three platoons
4. Horizontal and Vertical construction and repair -- four platoons
5. Support [self-sustaining capabilities] -- 180 men divided into platoon size elements

Army Combat Heavy Battalions. In 1974, the Army converted it's general engineering construction battalions to "Combat Heavy" battalions (29:16). Before 1974, the wartime skills of Army engineer battalions suffered due to construction intensive operations. This is similar to what happened to the 554 RHCES in the early 1980's before the 1987 ORIs. Like the AF, the Army wanted it's newly converted engineering battalions to perform plenty of peacetime construction and simultaneously prepare for a wartime mission. However, the new battalions were soon overloaded by tasks to perform both general construction and light infantry operations. In 1985, an Army task group was organized to redesign engineering battalions. The major factor considered by the task group was the Army Airland battle Doctrine (29:16). Also, since the mission of the engineering battalions were being confused with that of an

infantry battalion, the task group focused on redefining the scope of employment operations. They made recommendations to reduce the self-sustaining security needs of individual battalions (29:17). They obviously felt that engineers should do the job they were sent to the field to do and not spend most of their time defending themselves. The other factors considered by the task group were skill use, rank structure, and modern construction practices (29:19).

The table below shows the changes made to the balance of capability and manning in the Army battalions.

Table 4. Army Battalion Conversion

	OLD	NEW
Strength	798	707
Officers	32	32
Warrant Off.	9	3
Enlisted	757	672
General Construction	62%	53%
Earthmoving	38%	46%

(29:19)

For comparison, Table 5 (page 59) provides similar figures for current structures in RED HORSE and Prime BEEF.

The reorganization of the Combat Heavy battalions also meant deleting some engineering missions from several of the units. However, they recognized that it was important to retain all skills. They also noted "some specialized tasks

are beyond the capability of standard unit organization and should be employed on an "as needed" basis" (46:30).

Table 5. Comparison: RH and Prime BEEF

	RED HORSE	Prime BEEF
Strength	400	200
Officers	16	32
Enlisted	384	168
Capabilities		
Horizontal Construction	43%	15%
Vertical	51%	61%
Other	6%	24%

* NOTE: Percentages are based on available Productive Manhours

(33)

These specialized tasks were the basis for forming the following nine "Engineer Cellular Teams":

1. Quarry Operations
2. Concrete mixing and paving
3. Heavy equipment support (one to two men)
4. Asphalt paving and mixing
5. Utilities (facility support)
6. Power line (exterior)
7. Real Estate (general construction)
8. Power Plant (construction)
9. Welding (46:32).

Effective operation and integration of the cellular teams require consideration of several common needs: maintenance, logistics support, personnel support, security, communications, and transportation (46:30-32). The Army decided that the cellular teams would be detachable but they

would operate with support from a larger unit. Therefore, the cellular teams were designed with no organic logistic support capability (46:30).

Other Ideas. In 1987, HQ PACAF/DE tasked the 554th to examine their mobility capabilities ". . . with an eye toward making RH-1 and RH-2 lean, mean, and mobile" (48). The 554th's staff analyzed the vehicle requirements for the first two echelons and decided that seven vehicles were not needed on RH-2 because they were more suited to permanent construction needs. The vehicles identified were the asphalt distributor, concrete mixer, self-propelled trencher, fuel bladder, 8-ton dolly, roto tiller, and telephone line truck (48). This suggests that considerable reductions might be made in the early requirements of airlift if AFCE examines the time-phased need of RED HORSE equipment.

After performing a study of their own, HQ PACAF/DEO recommended that forward deployed RED HORSE units operate with smaller packages (force modules) of people and equipment for intra-theater mobility. These packages should be capable of responding to simultaneous requirements with their warti · geographic area of responsibility. They also recommended that the over-the-road hauling capability of RED HORSE be increased (34).

Summary

This chapter discussed initial design considerations and the problems and capabilities in the RED HORSE force structure. One significant aspect presented was the intent to build certain capabilities into RED HORSE modules. The RED HORSE designers had envisioned a highly mobile, deployable, self-sufficient, heavy repair and construction force that could act in absence of Army and Navy support.

Unfortunately, the units have never been entirely self-sufficient or deployable. Yet still the Air Force bases their planning on these unachievable or unrealistic objectives with all too real constraints. Some believe the current structure was designed simply to make airlift planning easier. However, the current 3-echelon structure (with its ill-defined mission) is inadequate for potential operations in the spectrum of armed conflict.

Internally, the Air Force has generated potential solutions such as task organization. The Navy and Army have generated solutions which were applied in their restructuring efforts. There does not seem to be a shortage of probable solutions. What has yet to be defined is the criteria or basis for evaluating alternatives.

IV. Methodology

This chapter describes the steps taken to answer the research questions provided in chapter one. The following discussion presents the methodology used to achieve the research objectives and to answer each of the eight investigative questions.

Method of Approach

The original goal of this research effort was to suggest a way to improve the deployment capabilities of RED HORSE by restructuring or realigning mobility team configurations. However, because this topic is new to academic research, the major dimensions of this research topic had never been systematically explored or documented as such. Even more, a preliminary review of the literature indicated that existing data might be inadequate to solve the problem in one study. More data needed to be generated. Consequently, the best approach to accomplishing this research was a "two-stage approach" (25:64). The two stages were (1) exploration to validate the research problem and objectives (as defined by preliminary reviews) and (2) execution of the actual research study in terms of the objectives that have been validated.

First Stage. The first stage was essentially guided by the first four investigative questions. This stage was accomplished through a literature review and several

telephone interviews with RED HORSE personnel and MAJCOM contingency planners. The most important goal of this stage was to evaluate the magnitude of the problem and the objectives. Again, the original objective was to suggest a way to improve deployment capabilities through force module applications. The data revealed in this stage led to a refinement of the objectives. Instead of trying to suggest a new structure, suggesting the criteria and standards for redesign became the new goal.

The literature review contained student theses and reports done at the Air Force Institute of Technology at Wright-Patterson AFB, Ohio, and both Air Command and Staff and Air War Colleges at Maxwell AFB, Alabama. The review also contained correspondence and meeting minutes from the readiness divisions of HQ TAC/DE and HQ PACAF/DE. Documentation from the Army and Navy was reviewed to attempt to answer question five about the techniques of other services.

The Historical Research Center, Maxwell AFB, Alabama, was visited to review the historical documents on the creation and development of RED HORSE. While at the center, other documents were reviewed such as the Corona Harvest Reports on the Vietnam War and the unit histories of past and current units. These documents were the most helpful in understanding the factors for mission planning and RED HORSE

force structure design. They were also helpful in understanding why RED HORSE is perceived to have problems today.

Second Stage. The second stage was guided by the last four investigative questions. The purpose of this stage was to determine the criteria and standards for force module applications in RED HORSE. Existing data was collected through an additional literature review, telephone interviews, and a modified Delphi study. Delphi is a data collection procedure which is discussed in the next section of this chapter.

One critical element of the second stage was the expert opinion from persons most familiar with RED HORSE issues. Twenty experts were selected and agreed to participate in this study. These persons were chosen because of their experience in RED HORSE squadrons, their involvement in past and current studies, or because they were highly recommended by the engineering readiness staff at HQ TAC and by the AFESC readiness staff.

Delphi

Delphi is a procedure for "eliciting and refining" the opinions of a group of experts (10:v). For this reason, Delphi was included as part of the methodology for the second stage.

The advantages of Delphi are designed into the process. Delphi allows for protection of the identity of participants

which may eliminate any artificial conformity of opinion (5:2). Delphi also allows for greater control over the information that is passed between participants. Finally, Delphi allows for quantitative evaluation of expert opinion (10:v).

This effort was named a "modified Delphi study" because only one questionnaire was sent to the experts. This study also slightly differs in the requirements to reach a consensus. Several of the more objective questions did not require a consensus. Currently, Delphi processes are believed to require several iterations [of structured interviews] (10:15). The first iteration in this study was structured; the questionnaire is included in Appendix A. The second iteration was unstructured; it was accomplished by telephone interviews.

Although the group size was only twenty, the results are very reliable. Experiments have shown that when it comes to soliciting expert opinion, the error rate does not change significantly by increasing the group size for numbers greater than nine (10:12). However, size increases do produce a steady [but small] increase in the reliability of the results (10:13).

Justification of Approach

Referring to the original goal of suggesting effective team configurations, this goal may have never been reached in the time allotted for preparation of a student thesis.

Although the problem seems simple enough to answer, the time and scope of research for defining the problem, building, testing, and refining the concept could be too much for one student thesis (8:47-55). This amount of research effort is best suited for programmatic research. Consequently, this study dealt only with defining the problems and building the concepts. Quantitative evaluation (of numerical data) was not planned to be a part of this research. Important elements of data generated in this research are found in expert opinion. The survey instrument contained mostly open-ended questions designed to solicit unrestricted expression of concepts. Even though this increases the subjective value of the data, quantitative analysis becomes inappropriate.

V. Findings and Analysis

Overview

The objective of this research was to define the criteria and standards for force module applications in RED HORSE. Eight investigative questions were developed to guide this effort. The literature review and delphi study provided answers to the questions. This chapter analyzes the findings to support development of a criteria for a smoother, more flexible, and more responsive deployment capability for RED HORSE. The following discussion describes the research and examines each investigative question separately. The final sections include a summary and analysis of expert opinion solicited in the Delphi study followed by a presentation of the criteria.

The Research Process

The research was mostly accomplished as described in Chapter Four. However, several deviations did occur and are important to understanding the complete analysis.

First of the 20 experts who agreed to participate only nine responded to the questionnaire. Therefore, only nine respondents were included in the second round of interviews. Fortunately, other research has shown nine respondents are sufficient for this methodology.

Second, during the second round of interviews, two respondents were interviewed in person.

The third deviation involves presentation of findings. Several of the survey questions used numerical measuring scales. The resulting data was quantitatively evaluated using simple summary statistics, mean and mode. However, at best, the results only estimate what the majority of experts would say. Significance levels and error rates were not computed.

Investigative Questions

Question 1.

What were the early considerations or factors used in determining the original support requirements and team composition in RED HORSE?

The literature review provided key answers to this question. A visit to the Historical Research Center at Maxwell AFB uncovered "Project RED HORSE" reports, Corona Harvest reports, and old RED HORSE regulations. These documents revealed the considerations of the original RED HORSE planners. The goal was to identify the design considerations for the 400-man, 3-echelon structure. The expectation was to discover the rationale for the current RED HORSE force structure. The assumption was that the creators of the RED HORSE concept determined what the team compositions should be by analyzing such things as minimum requirements for force beddown or the minimum number of heavy equipment operators needed to upgrade tactical runways. Unfortunately, nothing could be found to validate this assumption.

RED HORSE's original design contained elements of the earliest mobile engineering teams. Therefore, the design of these teams were also considered. Previous discussions (page 17) revealed that the first mobile AFCE teams were created after the Korean War, sometime around 1958. The factors considered were team divisibility--"detachable cells," quick response, and mission compatibility with the Army mission.

RED HORSE was originally designed because of the AF's inability to provide a force capable of constructing expedient runways in Vietnam. Therefore the capability to build airfields is a significant factor. The word capability cannot be stressed enough. Below is a repeat of the list of needed capabilities that were identified in the literature review.

1. An engineering staff to plan work.
2. Advanced airfield survey teams.
3. Expedient bomb damage repair.
4. Expeditionary airfield construction.
5. Beddown of 1000-man force.
6. Utility system construction.
7. Well drilling.
8. Rapid runway repair using AM-2 matting.
9. Ability to perform field maintenance on vehicles.
10. Mess and dispensary operations.
11. Ability to move by air and convoy.
12. Overhead personnel for administration, supply, and costing.
13. 90-day [intra-theater] deployment capability.
14. Barrier installation capabilities.
15. "Capability to deploy "blocks" [sic] of skills for specific tasks . . ." (HQ USAF Study).

An assumption can be made that the original design was made to fit a Vietnam scenario. In other words, the design

was suited to the need to expand the airfield (basing) in a low intensity environment with guerrilla warfare tactics. The battle front was very fluid and many platforms were needed to project the airpower. One question might be does the evolution of technology make a difference today? Have changes in the airpower basing requirements affected the needs of RED HORSE in a low intensity conflict?

Another consideration was the stability of the units once they were employed (page 27). The AFCE commanders in Vietnam wanted a force that could stay in place for some time and not be greatly affected by large swings in work load. They wanted the units to support recovery efforts that were beyond the capabilities of normal base forces. They wanted the units to operate independently and to be self-sustaining to a limited degree. They wanted the units to possess limited active defense capabilities. Limited active defense meant augmentation by security police forces when employed in a hostile environment.

All of the previously mentioned factors were considered in the design of RED HORSE modules. How these factors were translated into quantities of men and equipment is not known. The development of the 3-echelon system is also not known. The evidence suggests that the three echelon deployment system was not standardized until sometime around 1972. Colonel Glaze's comments might suggest that this

system was created primarily to make airlift planning easier, not to make RED HORSE air transportable.

Summing in a few words, the original team structure was based on heavy (and expedient) repair and construction capability, self-sufficiency, and contingency response capability--quickness and flexibility. The origin of the 400-man, 3-echelon structure was not determined.

Now, since the development of the RED HORSE team structure and the development of AFCE contingency support capability has been discussed, we are more prepared to analyze the problems with current RED HORSE capability.

Question 2.

What are some specific problems which have impaired deployment capability?

In search of the answer to this question, the focus was on the generic problems of all RED HORSE units and the specific problems of the 554 RHCES. The interpretation of deployment capability impacts allowed coverage of problems which are external to the deployment process but nonetheless affect the overall contingency response capability. The answers were found in unit histories, past studies, and correspondence of major commands.

The generic problems fall into several areas. One is the inability to quickly mobilize RED HORSE assets. This is due to the incompatibleness of realistic constraints with unrealistic operational planning and guidelines. AFCE's planning is based on moving two very heavy and large RED

HORSE modules, RH-2 and RH-3, respectively, 494 and 868 tons. Even if the AF had the strategic lift to deploy a RED HORSE unit, it could still be six weeks before the entire unit completes the deployment and regeneration phases. Related to this is the availability of priority airlift. Experience in past conflicts proves "when the whistle blows" AFCE will most likely not receive priority airlift for intra-theater deployments. The other part to this is the time and manpower required to consolidate (from work locations), mobilize, and prepare assets for airlift. For the 554 RHCES this is an extremely difficult task and feasibility requires pickling of some aircraft cargo increments. Surprisingly, even though the early planners recognized (as early as 1966) the problem of airlifting RED HORSE assets, not much has been accomplished to relieve the constraints.

For the 554 RHCES, personnel TDYs for construction projects also poses a problem to mobilizing personnel for deployment. In the past the 554th has had as many as 150 persons working at construction sites at distances that precluded use of the 150 in deployments from Osan AB. In addition, the one year tour means at least 30 persons will be unavailable for deployment. At least 30 fall into the mandatory 30-day training window for new personnel. This only leaves about 220, but the actual number is likely to be less due to leaves, sickness, and vacancies. If 299

RED HORSE personnel are required to deploy RH-1 and RH-2, then obviously the manpower resource has to be more closely managed.

This problem with manpower availability leads into the issue of limited self-sufficiency. RED HORSE is not totally self-sufficient; it needs resupply capabilities for extended periods, security assistance in hostile environments, and contracting support for hiring of indigenous labor.

Another problem is the allowed but unacceptable deterioration of mission effectiveness due in part to a poorly defined doctrine and poor planning but also due to failure to update operational concepts. RED HORSE was created nearly 25 years ago and the first governing regulation was published 17 years ago. Since then, the fundamental operational guidelines have not been revised. This would not be a significant problem except for changes in various technologies (construction, aircraft, vehicles, heavy equipment, etc . . .), changes in Army-AF joint operational doctrine, changes in AFCE readiness posture (of Prime BEEF units), and changes in AFCE support planning methodologies.

The changes in vehicle and equipment authorizations is due partly to evolutions in technology. The RED HORSE table of authorizations has grown significantly since the late 1960's. The new equipment may be better but in some cases it is also larger and heavier which translates into more

strategic lift. For example the Jeeps and 3-passenger vehicles are slowly being replaced by the larger and heavier, 6-passenger diesel trucks. The larger vehicles have made it difficult to deploy RH-1 on two C-130s.

Something mentioned in the literature review is the impact of dispersed operations on unit effectiveness. The Corona Harvest reports indicated that dispersed operations in Vietnam often led to dilution of unit effectiveness. This should be a top consideration in planning RED HORSE employment operations. Unfortunately, estimates indicate that the AF does not have enough RED HORSE units to handle all the engineering construction support requirements that could be generated in a conventional war. Therefore the AF may be forced to operate in dispersed conditions.

Question 3.

What techniques were employed in past attempts to improve deployment capability?

Like the previous question, the answers were found in unit histories, past studies, and correspondence of the major commands. The answers were restricted to those attempts made before the formation of the TAF RED HORSE Steering Committee in 1987. The focus is on the major attempts that would or did produce significant changes in RED HORSE capability. Many of the techniques are not discussed because they are less significant for this study For example, attempts made in more effective

containerization of RED HORSE equipment is an important issue but to far removed from the issues of this study.

In the early 1970's, RED HORSE regulations discussed the employment of 200-man augmenting units to aid in employment operations. These units were considered to be an expanded capability that helped reduce the heaviness of the line units but also provided enormous equipment support. This concept of using half-size RED HORSE units to augment line units is something that deserves consideration for future application.

The 554 RHCES staff has tried to control those elements within their control and also has made recommendations to its headquartered readiness staff. They reduced mobilization and processing time by pickling equipment and vehicles and restricting the movement of essential personnel. This procedure works for the wartime mission but has negatively impacted the peacetime construction training efforts. Not wanting to lose RED HORSE as a major construction agency, the PACAF staff asked the 554th to reexamine their capabilities with the goal of improving deployment capabilities. The 554th put together a report which suggested that improvements could be made in vehicle distribution among the UTCs. Some vehicles were not identified as being needed in the early days of contingency construction operations.

RELOOK tested several alternate configurations of RED HORSE UTCs as an attempt to reduce the heaviness of individual modules. RELOOK was also geared towards eliminating the inefficiencies in the match up of RED HORSE UTCs to specific taskings. Even though RELOOK initiatives were not adopted, many good ideas were generated and tested. Questions were raised that should have been answered a long time ago. For example, should we always plan for deployment of entire UTCs or should we have the flexibility to break out unneeded equipment?

Question 4.

What are current recommendations for improving deployment capability?

The answers to this question were taken primarily from the literature and interviews with AFCE contingency planners. The recommendations were screened for feasibility during discussions with members of the TAC/DE readiness staff.

The TAF RED HORSE Steering Committee recorded several recommendations. The most significant to this study is deployment based on force modules. Force modules should allow deployment of lighter, more responsive RED HORSE forces especially in crisis planning situations. Other recommendations made by the committee include better threat analysis, theater specific tasks identification, in-theater support analysis, operational concept refinement, and force structure assessment. Some of these recommendation were

considered in the Delphi study design. Questions were included to solicit expert opinion on operational concepts, in-theater requirements, and force structure design.

In his study, Major Ryburn made several recommendations which are being considered by RED HORSE planners. Ryburn recommended that a dual structure be adopted to accommodate both theater conventional planning with prepositioned assets and specific taskings of less conventional contingencies. He also recommended a RED HORSE doctrine which considers the differences in crisis and deliberate planning and the differences in low intensity conflict and conventional theater warfare. These recommendations were also considered in the Delphi study design.

Question 5.

What techniques are other military branches using to deploy similar combat engineering units?

The Navy and the Army have mobile combat engineering units which are similar to RED HORSE in force structure, composition, and mission. This researcher suspected that an analysis of the structure of these units might reveal methods applicable to making improvements in RED HORSE capability. Fortunately, something even more useful was uncovered during the research. Both the Army and Navy had made attempts to improve the contingency response capability of their respective units. Their methodologies were reviewed for possible application to this study.

The common element of the Army's and Navy's improvements was task organization. This is also comparable to the specific tasking concept of Ryburn's dual structure. In addition, the reconfiguration options of PACAF are similar to the task organization of the Navy SEABEEs.

Several considerations of the Army and Navy improvements were included in the Delphi study design. The Navy took a look at time-phased employment requirements. The Army took a look at skill utilization, rank structure, and logistic and basic support requirements.

Question 6.

What relevant planning factors are crucial to tailoring a RED HORSE deployment?

The answers to this question were derived through an analysis of the answers to the first five questions and the expert opinion provided in the Delphi study. This is the first effort towards synthesizing the criteria and standards for force module applications. For deliberate planning and more so for crisis planning, a rule or criteria is needed to test and evaluate the effectiveness and efficiency of RED HORSE taskings. As Colonel Glaze suggested, we cannot keep planning for the sake of making planning easier. RED HORSE taskings should be realistic and rigorous.

AFCE doctrine should present a framework for most planning. Doctrine accounts for such things as AFCE's role in the spectrum of armed conflict. Doctrine would also help

define the complimentary roles between RED HORSE and Prime BEEF and the plans for dispersed operations.

The location of each unit is another factor. The location of each unit greatly impacts the planning requirements. Forward deployed units have different requirements from CONUS based units and the 554th's requirements differ from those of the 819 RHCES in the European theater. Prepositioning and transportation requirements differ among the theaters. Contract support capabilities differ in each theater. AFCE planners must understand the theater specific requirements to adequately tailor RED HORSE deployments.

Another planning factor is the--required and desired--degree of self-sufficiency. It is a waste of resources to deploy RED HORSE forces into areas if they cannot obtain construction supplies, repair equipment, and provide food and water for the troops. It is a waste of engineering skill to deploy RED HORSE forces into areas where they spend most of their time defending themselves. AFCE needs to examine different employment scenarios and determine which self-sufficiency elements are needed in RED HORSE modules.

Other planning factors include transportation modes, travel distances, theater command relationships, host nation support, time-phased employment operations, skill and rank requirements, and logistic support requirements.

Question 7.

How does the heavy repair mission relate to mobility requirements for RED HORSE?

This question was actually raised by a member of the USAFE/DE readiness staff. The importance is understanding the relationships between requirements, mission, and capability. As Colonel Glaze suggested, the AF has compromised this relationship for political reasons. We saw a little of this in the RELOOK study. Understanding the relationship is a preliminary step to testing the criteria and choosing a structure that would increase planning flexibility and responsiveness. While trying to answer this question, more questions were raised--but not necessarily answered. How would changes to the structure affect mission capability? Conversely, how would changes to the mission affect force structure needs?

The relationships between the heavy repair mission and the mobility requirements (or rapid response capability) should be spelled out by doctrine. Doctrine should identify how changes in one would affect the other. The obvious assumption is that an increase in heavy repair capability requires an increase in UTC size which probably means a decrease in mobility. Since its conception, RED HORSE's heavy repair capability has been increased through the addition of more heavy construction equipment. This additional equipment has made the UTCs heavier and less mobile for convoy or air movements.

The relationships may be further explained through the force module elements--manpower, equipment, and supplies. Through these elements we should easily be able to estimate the incremental impacts to mission capability and mobility requirements. Even more we should be able to find an optimal balance of those elements if our objective is to improve deployment planning and execution.

If engineering planners can agree on what the mission of RED HORSE should be, we then should be able to estimate the force structure elements required to achieve that mission. If we want RED HORSE to do heavy repair, then it must have heavy repair elements. Modules should be designed to project that capability in the most expedient and most effective way possible.

Question 8.

What are possible combinations of personnel and equipment that will improve the current response capability of RED HORSE while still meeting mission requirements, i.e., revised force modules?

The goal here was to find evidence that could be used to validate the suggested criteria for RED HORSE force module applications. The analysis was compared to the suggestions of past studies. Historical documents revealed the 200-man augmenting units as one option. Five other options (see Appendix A) were uncovered in the review of past studies. One was provided by the RELOOK study. Major Ryburn presented another option in his Air Command and Staff

College report. Senior Master Sergeant Anderson presented three others in his draft report for the PACOPS/DEO readiness staff.

Expert Opinion: Delphi Study

The Delphi study was divided into seven areas. The succeeding discussion is a summary and analysis of the responses from the experts involved. The results of the Delphi study were most important in building the criteria for force module applications.

Area 1: Experience of Respondents. The experience of respondents varied from one year in a RED HORSE unit to 3 years on a MAJCOM readiness staff. Some of the participants had several years of Vietnam experience in a RED HORSE unit.

The experience of some of the respondents increased their usefulness to this study. Two respondents participated in the RELOOK study. Several others participated in conferences on RED HORSE doctrine and concept of operations.

Area 2: Historical Perspective of Respondents. This area was designed to solicit opinions about deployment structure and the intended planning criteria, inter versus intra-theater mobility.

Of those respondents familiar with the historical development of RED HORSE, the majority initially stated RED HORSE was intended for intra-theater mobility, not

necessarily inter-theater. After the second round of interviews, all respondents indicated RED HORSE is not totally suited for rapid deployment between theaters. They believed this to be especially true when it involved moving the entire 400-man unit. However, some believed inter-theater movement is not totally infeasible if time constraints are relaxed and strategic lift is made available. Unfortunately, the constraints may not ever be relieved.

In dealing with the historical issues of RED HORSE, the beliefs and perceptions of mission planners are potential indicators of future employment planning. If true, the perceptions of the planners (involved in this study) would indicate a trend towards more realistic deployment planning for RED HORSE.

Area 3: Force Structure Design. This area was designed to solicit expert opinions on the criteria for building force modules. The topics were inter versus intra-theater deployments, skill organization versus task organization, inclusion of a contracting capability, broad planning factors, self-sufficiency, and time-phased skill needs.

A consensus was not initially reached on whether the current structure's mission should be designed around inter or intra-theater deployments. The initial survey resulted in 4 for intra, 3 for inter, and 2 for both. During the

second round it was determined that some of the respondents failed to notice the question concerned only the current 3-echelon structure. Eventually, a clear majority suggested the current structure is suited solely for inter-theater deployments when the entire unit needs to be quickly moved.

The second question is this area asked the participants to assess the merits of a structure divided by major skill areas. The majority believed force modules should not be divided along vertical, horizontal, and support disciplines. Some concerns of this proposal were flexibility to respond to unplanned contingencies and dilution of capabilities. Two respondents also recommended multi-skilled labor be included as an element of force module development.

The last four questions in this area mostly dealt with certain elements of force structure design. the respondents were asked specific questions about what capabilities should be in RED HORSE and what are the relative priorities of need in contingency situations.

One question asked what are the most important factors to consider in the design of force modules. The most frequent response was "theater specific requirements." Initially six of the nine respondents mentioned this as one of the three they felt were most important. Other factors considered to be highly important include doctrine and threat.

The experts also felt new modules (if designed) should possess limited self-sufficiency in terms of intra-organizational dependencies. Each module should contain the organic capability to conduct limited operations as determined by designated missions. Of course, the degree of self-sufficiency is influenced by the nature of the war, location, and duration. One expert also recognized the significance of external political and organizational influence on the logistics support system. An effective logistics system is a prerequisite for effective RED HORSE operations. Self-sufficient operations are contingent upon logistics.

Another desired quality of force modules is the capability to handle various contingencies. Assuming significant variation exist in skill requirements for bare base operations, heavy bomb damage repair, and expedient construction, the relative importance of certain wartime capabilities may also vary accordingly. For example, well drilling capabilities may be more important for bare base operations than for heavy bomb damage repair.

The experts evaluated the priority of need of eight capabilities separately under three possible taskings. The results are shown on the next page.

Table 6. Ranking of Engineering Capabilities

I. Tasked for Bare Base Operations (Force Beddown)
II. Tasked for Heavy Bomb Damage Repair
III. Tasked for Expedient Construction

****

	Categories								
	I			II			III		
Capabilities	A	B	C	A	B	C	A	B	C
			*			*			*
Security	1	1	* 1	2	1	* 2	1	1	* 1
Earth Moving	2	2,5	* 2	1	3	* 1	2	4	* 2
Vertical Constr.	4	4	* 5	6	3	* 6	3	3	* 3
Horizontal Constr.	4	3	* 4	3	2	* 3	5	2,3	* 5
Well Drilling	3	5	* 3	7	7	* 8	6	6	* 6
Quarry Ops	6	7	* 7	6	4,5	* 7	7	5	* 7
Material Testing	5	6	* 6	4	5	* 4	4	2	* 4
Barrier Inst.	7	7	* 8	5	4,6	* 5	8	8	* 8

"A" - represents rank of mean response

"B" - represents modal values (used to decide ties)

"C" - represents assigned ranks

This table indicates (of the eight capabilities listed) security defense and earth moving capabilities are considered highly needed in all three potential wartime taskings. On the other hand, Quarry operations and barrier installation capabilities are considered low priorities. Vertical construction capability was assigned a moderate ranking in all categories except heavy bomb damage repair. This makes sense assuming heavy bomb damage implies enough damage to airfield pavements to disrupt flying operations. Even more, in this category, material testing, barrier

installation, and horizontal capabilities were given a higher priority than vertical construction capabilities.

Another seemingly significant difference in the distribution of priorities between categories is the priority given to well drilling capabilities. for bare base operations, well drilling is given a higher priority of need than in the other categories.

The bottom line here is the experts obviously perceive a need to vary the priorities given to capabilities for different situations. This supports arguments to build flexibility into RED HORSE deployment planning by adopting task organization.

Area 4: Contingency Support Capability.

This area was designed to solicit expert opinions on the adequacy of RED HORSE overall contingency support capability, contingency operation concepts such as resupply of consumables, and the adequacy of individual special capability teams.

When asked to rate the adequacy of RED HORSE's capability, the experts agreed the capability is equal to or better than what might be required to support conventional or limited warfare. On a 7-point scale (7 meaning "significantly greater than", 4 meaning "equal to"), the mean response for conventional warfare was 4.77. The most frequent response was 6 -- four experts. For low intensity conflict, the mean response was 5.11. The most frequent

response was 6 -- five experts. In both categories, the majority of experts believed the current capability to be more than what might be required in wartime. Keep in mind, this is based on the capability and taskings of one unit.

The experts all agreed the most important factor in self-sufficiency is the capability of the logistics functions. However, some indicated the logistics pipeline force needs further evaluation. Are personnel receiving adequate training? Can we truly provide RED HORSE with adequate construction and repair materials in all supported theaters?

Even though a consensus was not reached, six special capability teams were identified as being inadequate. They were quarry operations, barrier installation, communications, concrete mobile, material testing, and well drilling. The primary concerns of the experts were sufficiency of team training and usefulness of equipment. Some also questioned the need for a dedicated concrete mobile team.

As an overall analysis of the opinions in this area, the experts are suggesting RED HORSE can perform its assigned mission. Unfortunately, there is unacceptable room for improvement in personnel training and equipment.

Area 5: Mission.

This area was designed to solicit expert opinions on the compatibleness of RED HORSE and Prime BEEF missions, the

scope of the RED HORSE mission, the security posture, and command relationships. These attributes are important in specifying RED HORSE employment concept of operations and identifying external relationships.

Initially all but two of the respondents agreed there is no problem if some overlapping of responsibility occurs between RED HORSE and Prime BEEF. They believed this to be acceptable due to similarities in skills -- "all are engineers" -- and the redundancy it allows for using backup forces.

In the second round of interviews the two who disagreed indicated there may be no real problem if managed properly. The goal should be (as one respondent said) to maximize engineering capabilities, seeking an optimal balance of unit specialization with force redundancy.

The experts were asked whether RED HORSE's primary tasking should be force beddown, bomb damage repair, or heavy construction for base upgrade. For this question a consensus was not expected. This question was included as a means of validating responses of other questions. For example, in another area, one respondent indicated that Prime BEEF should have first shot at force beddown taskings. In this area the respondent answered with some consistency by saying "RED HORSE could be used for initial force beddown but planning should be based on construction." Of all the

respondents, the most frequent response was "all three." The next most frequent response was "bomb damage repair."

Another under-specified aspect of RED HORSE's roles and missions is its role in providing perimeter security, either for the unit or for the base while reinforcing other security forces. The experts believed RED HORSE should "do it all" but should plan for work party security. The question that remains is what proficiency level should the units maintain?

The last survey question in this area dealt with theater command relationships for the units. A consensus was reached on the second round. All experts agreed that depending on the theater of operations, RED HORSE elements should work for NAF or regional CE commanders.

Area 6: Personnel/Skills.

This area was designed to solicit expert opinions on the skill composition and the importance of certain skills to mission capability.

After the first round of interviews, all but one of the experts believed all authorized AFSCs were needed in RED HORSE. The one expert questioned the need for asphalt and concrete mobile skills. He indicated these were Army missions which required significant logistical support. During the second round, he indicated his concern was based on the assumption these skills would be used mostly for construction.

A consensus was not attempted for the remaining questions in this area. These questions were included to measure expert opinion on the relative importance of certain non-engineering skills. The rationale is that if limited lift is available to move all RED HORSE personnel to a bare base, then some personnel must be left behind to wait for other transportation. What skills are more important than others in a bare base environment?

The experts were asked to rank the skills (1 for most, 9 for least) as far as importance to unit self-sufficiency. The results are tabulated below.

Table 7. Ranking of Non-engineering Capabilities

	Rank of Means	Modal Values	Rank Assigned
Medical	2	2,3	2
Training Manager	8	8	9
Financial Manager	7	6,7	8
Supply	3	2	3
Environmental Support	4	6,7	5
Logistics Officer	5	4,6	6
Family Physician	6	3,9	7
Vehicle Maintainers	1	1	1
Machine Shop Tech.	4	5	4

The experts were also asked to evaluate whether the skills were needed most for (1) initial base development, (2) operations and maintenance, (3) sustained operations, or

any combination of all three. The opinions were measured on an ordinal scale which required results to be based solely on the most frequent response.

Table 8. When Skills are Needed Most

	Phase of Operations
Medical	Early -- Initial Base Devel.
Training Manager	Late -- Sustained Operations
Financial Manager	Late -- Sustained Operations
Supply	** no clear choice
Environmental Support	Early -- All three
Logistics Officer	Middle -- Operations and Maint.
Family Physician	Early -- Initial Base Devel.
Vehicle Maintainers	** no clear choice
Machine Shop Tech.	** no clear choice

Except for the ranking of the Family Physician and the Environmental support skills, both sets of data have parallel implications. The medics and vehicle maintainers are most important to self-sufficient operations and should deploy with early elements. The least important contingency skills are financial and training and should probably deploy with later elements. This is especially true if the least complex tasks of early phases can be performed by other AFSCs.

The variation in the ranking of the Family Physician and Environmental support skills may be due to the experts lack of general knowledge of these areas. The variation may

also be attributed to opinions that the skills are important, but may temporarily be performed by others.

Area 7: Suggested Force Structure.

This area was designed to solicit expert opinions on the five suggested structures included in Appendix A. The experts were also tasked with choosing a (or recommending their own) structure they thought had the greatest potential for future applications. The objectives were (1) to allow the experts to freely speak about RED HORSE force module design and (2) to use their opinions to build the criteria and standards for future applications.

The experts were asked to consider the following qualities for a mobile Civil Engineering force:

1. Ability to quickly mobilize personnel and equipment
2. Ability to transition from peacetime mode to wartime configuration.
3. Ability to accomplish heavy bomb-damage repair.
4. Reliability of contingency engineering capabilities.
5. Command and control relationships.

Based solely on frequency of selection, Option 2 (selected five times) might represent the best structure for future applications. Options 4 and 5 were both selected once. Two respondents decided not to select any option on the basis that all five were insufficient. Some of the reasons for selecting Option 2 include:

1. Good for crisis action planning
2. Good for forward deployed operations
3. Greater flexibility for predetermined tasks
4. Supportable by war planners
5. Good if used with prepositioning

Some of the reasons for not selecting Option 2 include:

1. Deliberate planning still requires total deployment.
2. Task organization may present command and control problems.

A consensus could not be reached for this area, but the contributions of the experts helped in developing criteria to be used in force module applications. The explanations and justifications, given by the experts, provided additional insight on desired attributes of a standard structure.

The next section in this chapter will be used to define the criteria. Actually, the criteria has already been discussed in other areas. The following is an attempt to bring the concepts together and present them in a doctrinal framework.

Suggested Criteria

Referring back to the doctrinal framework presented in Chapter Two, engineering planning criteria become a part of the "equation" for capability. The criteria is used to evaluate and select the components -- people, equipment, and supplies. The criteria of AFM 2-XX are in a sense desirable attributes for components. To be consistent with the proposed direction of HQ USAF melds the findings of this research with the previously mentioned attributes. The list (shown in outline form below) is not meant to be completely exhaustive.

A. Suitability: appropriate

1. Considers potential threat to the unit.

(a) Affects required security defense posture.

(b) Depends on scope and intensity of the conflict.

2. Considers theater specific requirements.

(a) May require dispersed operations.

(b) Affects required logistical support.

(c) Impacts effectiveness of organic support elements.

(d) Accounts for Host Nation support agreements.

(e) May require support of indigenous labor.

3. Considers variations in necessary scale of deployments.

(a) May always require advanced parties.

(b) Transportation modes may differ: sea, ground, or air.

(c) Travel distances may vary.

4. Considers missions of external agencies.

(a) May be impacted by Army operations.

(b) Affects overall employment planning for AFCE forces.

5. Considers effective and efficient use of manpower.

(a) Some skills are more important than others in various situations.

(b) Required skill combinations may be affected by equipment and construction technology.

6. Considers appropriateness of equipment and vehicles.

7. Considers requirements of mission planners.

(a) Does it suit planning methodologies?

(b) Is it compatible with theater Oplans?

(c) Is it suitable for current logistics capabilities?

(d) Compatible with prepositioning planning?

B. Flexibility: adaptable to changes.

1. Considers variations in theater requirements.

(a) Flexible for variations in theater construction standards.

(b) Withstands need to operate in limited dispersed conditions.

(c) Withstands potentially frequent tactical movements.

2. Considers variations in level of conflict and intensity of taskings.

(a) Elements should be easily detachable for crisis planning.

(b) Internal deployment priorities for skills and capabilities should be flexible.

3. Considers variations in transportation modes.

C. Operability: capable of functioning in system.

1. Considers requirements for rapid mobilization.

2. Considers requirements of external logistics agencies.

3. Satisfies other mission requirements.

4. Considers availability of resupply channels.

D. Availability: ready for use.

1. Command structures and relationships are identified.

2. Role identified in plans.

3. Accounts for realistic shortfalls in equipment and training.

E. Affordability: can be supported with available resources.

1. Considers availability of (deployment and employment) logistical support.

2. Minimizes dispersed operations.

3. Considers availability of other theater engineering forces.

F. Reliability: dependable (for objectives).

1. Capable of accomplishing mission tasks.

(a) Bomb damage recovery, force beddown, expedient construction, etc . . .

2. Capable of supporting theater specific requirements.

G. Survivability: withstands hostile influences.

1. Capable of providing limited active defense.

(a) Considers work party security.

(b) Considers convoy security.

2. Capable of sustaining defensive capabilities.

3. Capable of limited operations with other Air Force security forces.

H. Resilience: withstands changes/quickly regenerates.

1. Capable of quickly regenerating following deployments.

2. Withstands large swings in work load.

I. Responsiveness: quickly reacts to taskings.

1. Considers response procedures for crisis planning.

2. Capable of rapidly mobilizing entire unit when in-garrison.

(a) Requirements vary with type of movement: inter- or intra-theater.

3. Capable of quickly transitioning from peacetime to wartime operations.

(a) Affected by internal command structure.

4. Once in place, Capable of quickly dispatching elements by normal intra-theater transportation modes.

5. Suitable command structure for quick response.

Summary

The above criteria were developed from analysis of historical documents, current literature, and expert opinion on the issues of RED HORSE contingency support capability. This research is only the first step towards finding a smoother, more flexible, and more responsive deployment structure for RED HORSE.

The criteria outline is not complete nor is it a "stand alone" decision tool. It is appropriate if used in a qualitative decision analysis technique suitable for multi-attribute, multi-objective decision making. The objectives are those things AFCE would like RED HORSE to be capable of doing. The attributes are those qualities we would like RED HORSE to possess. In this research the attributes are described in the criteria.

VI. Conclusions and Recommendations

Overview

This chapter presents the conclusions reached while meeting the objectives of this research. The discussion also offers recommendations based on each conclusion and for additional research.

Conclusion 1

The following questions were the original concerns of this effort: Can RED HORSE teams be modified to reduce the amount of necessary equipment without detriment to heavy repair capability? What factors should be considered to achieve a balance between heavy repair and rapid response? These questions cannot be answered totally without completion of the other phases of this programmatic research. Testing and validation still remains to done. However, the results are useful and do have some practical implications.

The results indicate RED HORSE modules can be modified or scaled down without significant impacts to heavy repair capability. However, the incremental impacts cannot be estimated without understanding the correlation between heavy repair capability and quantities of people and equipment. Attempts to retrieve data from HQ USAF or HQ AFESC indicated no unclassified sources provide quantitative estimates of the relationships.

Recommendation. Recommend a model be developed to show or predict the effects changes in quantities of people and equipment have on capability. For example, if five each 5-level carpenters and electricians are taken from RH-2, what is the nominal change in RH-2's ability to perform facility damage repair for 30 days? Along with this, standards and minimum levels of people and equipment should be identified to perform certain operations for 30 day increments at 8, 12, and 24 hour workdays. For example, what is the minimum number of RED HORSE personnel (identified by AFSCs) needed to perform 30 days of intensive utility upgrade in a bare base environment.

The model could be developed as a student thesis and would provide another means of evaluating capabilities of individual force modules. The model could also use algorithms in an expert system to suggest what blocks of skills are adequate for various missions.

Conclusion 2

Sometimes organizations become so involved in improving things, they forget to consider original concepts and lessons from past events. Such is the case with RED HORSE. Looking at how rewrites to the governing regulations and other directives have evolved shows that not only have we attempted to reinvent the wheel, we have weakened the support.

The results of this research suggest much is to be gained by synthesizing the historical lessons learned and current planning criteria. Since the employment of the first CE mobility teams, problems have been recorded as lessons learned in contingency reports such as Corona Harvest. The "wheel" will continue to be plagued by problems if AFCE fails to publicize and implement guidelines based on these lesson learned.

Recommendation. Recommend the Air Force continue to push for a formalized CE doctrine. In addition, a separate, unclassified document should be published which presents lessons learned in an historical context. This document could be completed as a student thesis and later published as an Air Force pamphlet.

Also, if not existing already, a separate panel should be developed to study the effects of new (technology) advances on RED HORSE, especially in the areas of construction and aircraft requirements. The panel could meet once a year and meeting minutes could be included as a supplement to other guidance.

Conclusion 3

A well developed RED HORSE force module structure becomes a great tool for planning around movements of small elements. The advantages are not as far reaching for planning rapid strategic movements of entire units. The reason is rapid strategic movement of CE forces is and will

most probably always be constrained by limited air lift. The effects of this constraint could be minimized if an effective prepositioning program becomes available.

The feasibility of a RED HORSE prepositioning program was one assumption made for this research. A prepositioning program would allow development of much lighter RED HORSE modules.

Recommendation. Recommend force modules be developed that are based on prepositioning programs. Imagine that maybe for RH-2, AFCE could concentrate on deploying personnel first (especially to MOBs or COBs) with the goal of using in place assets as much as possible. Follow-on equipment could be dispatched by RH-3 personnel or selected RH-2 personnel. Part of this effort would be based on:

1. Identifying minimum number of RH-2 personnel to go on separate modules.

2. Building personnel modules to include MREs, tools, weapons, erdalator (as needed), M-35 trucks for transport, and pup tents. This should be adequate for survival. Until equipment arrives all they really need is transportation, food, water, weapons, and cover. This module is suited for bare base operations.

3. Thinking in terms of minimizing airlift requirements. For some contingencies such as natural disasters some local equipment will be available for use.

Other Recommendations

1. Recommend AFCE develop better CESPG (Civil Engineering Support Plan Generator) planning factors for RED

HORSE. Interviews with mission planners indicated realistic planning factors for RED HORSE have not been developed.

2. Recommend a panel be developed to evaluate the RED HORSE Table of Authorizations (TA) for equipment and the condition under which it is used for deployments. Current guidelines require RED HORSE to deploy with all items listed in TA429. Unfortunately, much of the equipment is needed for peacetime operations and is not suitable for wartime. Maybe RED HORSE needs two separate TAs.

3. Recommend another delphi study be accomplished to validate the criteria identified in the findings.

4. Recommend another study (similar to RELOOK) be accomplished to examine other force structures such as the task organization proposed in Option 2. Some consideration should be given to the way the Marines develop their force taskings in crisis planning. The Marines have based their force modules on task organization.

Closing Remarks

AFCE has been operating under the principles of suboptimization (of the goal of providing a force for contingencies). Immediate tactical alternatives are downgrading the strategic effectiveness of contingency applications. AFCE needs to improve the coordination of short and long range planning.

If the process of finding the force module applications is represented in terms of scientific problem solving--

identify and describe, analyze, list alternatives, build criteria, choose and test solution--AFCE has done a poor job of building the criteria for testing and evaluating their judgments. Somehow all of this goes back to doctrine.

Final recommendation is to build AFCE doctrine with emphasis on coordination of long and short range planning. AFCE possesses a great combat engineering capability in the form of RED HORSE squadrons. Much is to be gained by a realistic evaluation of the contingency planning process.

Appendix A: First Round Delphi Survey

1. Definitions. Some definitions have been provided to facilitate standardization of the responses.

Contingency Support Operations. Actions which are required to aid, protect, complement, or sustain other forces. Actions should be based on reasonable anticipation of the enemy threat.

Deployment Capability. Quality associated with the ability to relocate forces to desired areas of operation.

Force Module. Group of combat, support, and service support forces (with supplies) for a specified time period, usually 30 days. Elements of force modules are combined or separately identified to allow easy adjustments in the TPFDD (Time-Phased Force and Deployment Data) which adds flexibility to crisis planning (AFSC pub 1, 1988). For the purposes of this research, force modules shall not be dependent upon operation plans or plans used in deliberate planning.

Heavy Repair Capability. Quality associated with the ability to restore heavily damaged facilities, utilities, and pavements to serviceable condition. Usually requires large earth moving capability.

2. General Comments.

a. This study will not be used to recommend changes to the current UTCs for RED HORSE. Its purpose is to gather information that may be used to add both flexibility in the planning and responsiveness in the execution of RED HORSE deployments. The scope is generic in nature and shall not include all the equipment issues.

b. One area of the survey includes some suggested mobility team configurations that have been generated by experts in the field. (Sources will identified at a later date.) These options have been provided for your comments and to stimulate your thinking. Please feel free to make comments anywhere on these documents.

c. Because you are the experts your participation and honesty are key to the effectiveness of this study. There are no right or wrong answers. Brainstorming only adds to the quality of the response; so feel free to consult with anyone in your unit. Your responses will remain anonymous.

d. This study has been designed not to take more than one hour of your time. Because most of you work these issues as part of your job, you will be provided an executive summary of this research after it is completed.

3. Specific Instructions.

a. Since the responses you give are considered expert opinions, please provide rationale for your answers, especially for areas where you feel strongly. Add any documents, examples, or experiences you have had that will help the other participants understand your response. Be assured any information that might reveal the identity of the respondent will be removed.

b. Additional pages are provided for comments you may have regarding this study.

QUESTIONS

AREA 1: YOUR EXPERIENCE

1. In what jobs and units were you assigned to that added to your experience with RED HORSE? How long were you in each?

JOB and/or UNIT	LENGTH OF TIME

2. What studies, working groups, or reports were you involved with that dealt with RED HORSE force structures?

TITLE	DATE

AREA 2: HISTORICAL PERSPECTIVE

3. If you are familiar with the historical development of RED HORSE during the Vietnam Conflict (either through actual involvement or through historical readings) state whether you believe RED HORSE was intended (designed) for inter-theater mobility, intra-theater mobility, or both. Explain.

4. The unit histories of RED HORSE units which operated in Vietnam suggest that contingency deployments were never accomplished or intended to be accomplished under a three echelon system such as the RH-1, 2, and 3 concept. What is your opinion of this assessment?

AREA 3: FORCE STRUCTURE DESIGN

5. As the mobility teams are currently configured, do you believe the mission of RED HORSE should be designed primarily around inter-theater deployments, intra-theater deployments, or both? Please explain.

6. Air Force sponsored studies and reports suggest another more appropriate force module structure might be divided along the same lines as the disciplines required for construction. For example, all AFSCs needed for horizontal construction capability might be grouped in one or several smaller mobility teams and the same could be done for vertical construction capability, administrative support, medical support, etc.... What is your assessment of this suggested configuration?

7. In light of the amount of contract construction accomplished in the Vietnam Conflict, should RED HORSE be given a contracting capability to be employed in similar environments?

8. What would you say are the most important factors that should be considered in the design of RED HORSE force modules? Choose any of the following or provide others.

- Doctrine, designated unit mission
- Generic contingency engineering support requirements (for all theaters)
- Potential threat
- Support needs
- Theater specific requirements

9. If lighter, smaller force modules are developed, should they be independent of each other (in terms of capability, self-sufficiency, logistics support, etc...)? What other factors should be considered?

10. Significant portions of RH-2 could be made deployable before 48-hours but will deploy based on airflow schedules. The airflow schedule also impacts the arrival time and sequence at the port of debarkation. Under such circumstances, each scenario might dictate that some capabilities (assets) arrive and generate sooner than others. If you were tasked with determining what was needed first at the deployed location, what priorities (for deployment) would you assign to each capability under the three scenarios listed below? Use "1" for highest priority and list any other capabilities that might apply.

I. Tasked for Bare Base Operations (Force Beddown)

II. Tasked for Heavy Bomb Damage Repair

III. Tasked for Expedient Construction

(List the priorities under the number for each scenario)

SCENARIO

I	II	III	
_____	_____	_____	- Security Defense (Weapons/Ammo)
_____	_____	_____	- Earth Moving Capabilities
_____	_____	_____	- Vertical Construction Capabilities
_____	_____	_____	- Horizontal Construction Capabilities (Concrete and Asphalt paving)
_____	_____	_____	- Well Drilling (water production)
_____	_____	_____	- Quarry Ops
_____	_____	_____	- Material Testing
_____	_____	_____	- Barrier Installation
_____	_____	_____	- Other (give name)

AREA 4: CONTINGENCY SUPPORT CAPABILITY

11. How would you rate RED HORSE's "actual" contingency support capability against what might be required to support <u>conventional warfare</u>? Circle one number.

1	2	3	4	5	6	7
Significantly Less Than			Equal			Significantly Greater Than

12. Low intensity conflict?

1	2	3	4	5	6	7
Significantly Less Than			Equal			Significantly Greater Than

13. What changes would you recommend for the current capability of RED HORSE?

14. Do you agree that the most important factor which determines self-sufficiency is the capability of the logistics functions (supply, vehicle maintenance, etc...)? If not, what is the most important factor?

15. In planning to conduct independent--self-sufficient--operations, which areas do you believe are not fully developed? (Example: Resupply of consumables) What recommendations do you have?

16. Are the special capability teams adequate?

Place a check in the appropriate box.

YES	NO	
_____	_____	- Airfield lighting installation
_____	_____	- Communications
_____	_____	- Concrete Mobile Operations
_____	_____	- Explosive Demolition Operations
_____	_____	- Expedient Barrier Installation
_____	_____	- Material Testing
_____	_____	- Quarry Operations
_____	_____	- Bare Base Installation
_____	_____	- Water Well Drilling
_____	_____	- Disaster Preparedness Mobility Team

If inadequate, why? Training? Equipment? Manpower?

AREA 5: MISSION

17. What are your thoughts on any potential overlapping of responsibilities of RED HORSE and Prime BEEF?

18. Should RED HORSE UTCs be tied to combat units for specific and dedicated support during contingencies?

19. For purposes of deliberate planning, should the taskings of RED HORSE be primarily force beddown, bomb damage repair, or heavy construction (for base upgrade)?

20. What is your opinion of RED HORSE's role in providing perimeter security or team security?

21. What changes, if any, do you recommend to the concept of employment in hostile environments?

22. Who should RED HORSE work for in wartime, i.e., flying unit commanders, regional CE commanders, etc...?

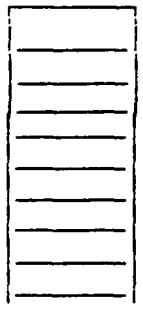
AREA 6: PERSONNEL/SKILLS

23. Are all of the skills currently assigned to the unit needed for RED HORSE contingency support operations? If you believe some are not needed, please note those and explain why.

24. How would you rank the following AFSCs, (1 for most important, 9 for least) in increasing the self-sufficiency of RED HORSE?

_____	- 90270.....Medical Service Technician (2)
_____	- 751x2.....Training Technician (2)
_____	- 672xx.....Financial Manager (2)
_____	- 645xx.....Supply (14)
_____	- 566xx.....Environmental Support (5)
_____	- 6616-.....Logistics Officer
_____	- 7024-.....Family Physician
_____	- 472xx.....Vehicle Maintainers (38)
_____	- 427xx.....Machine Shop Tech (2)

25. Bare Base operations may be divided into 3 phases: (1) initial base development--1 to 30 days, (2) operations and maintenance--31 to 90 days, (3) Sustained operations--longer than 90 days. In which phase of operations would you say the following AFSCs would be needed the most? Place a 1, 2, and/or 3 by each AFSC to specify the phase of operation.



- 90270.....Medical Service Technician (2)
- 751x2.....Training Technician (2)
- 672xx.....Financial Manager (2)
- 645xx.....Supply (14)
- 566xx.....Environmental Support (5)
- 6616-.....Logistics Officer
- 7024-.....Family Physician
- 472xx.....Vehicle Maintainers (38)
- 427xx.....Machine Shop Tech (2)

AREA 7: *SUGGESTED FORCE STRUCTURES*

When you evaluate the suggested mobility configurations that follow, please also consider the following qualities for a mobile Civil Engineering force:

(1) Ability to quickly mobilize personnel and/or equipment
(2) Ability to transition from peacetime mode to wartime configuration.
(3) Ability to accomplish heavy bomb-damage repair.
(4) Reliability of contingency engineering capabilities.
(5) Command and control relationships.

Five options are provided for your review. Feel free to comment on each option or recommend others. Please indicate (in the space provided below) which option you believe has the greatest potential for future applications.

OPTION 1

TEAM	DESCRIPTION	SHORT TONS	PERSONNEL	RESPONSE
1	Adv. Engineer. Support	11	12	12 Hrs
2	Beddown Support	98	58	24 Hrs
2c	Convoy Package	45	0	24 Hrs
3	Enhanced CE Support	250	52	48 Hrs
4	Heavy Repair Echelon	Undetermined	282	6 Days
5	Well Drilling Equip.	120	0	Unspecified
6	Paving Equipment	68	0	Unspecified
7	Quarry Equipment	Undetermined	0	Unspecified

Advanced Engineering Support. Mission similar to current RH-1. Air transportable on 1 C-130.

Beddown Support. Performs advanced airfield preparation for reception of single squadron beddown forces, limited earth moving and site preparation for Harvest Eagle/Bare erection; erects Harvest Eagle/Bare; installs airfield lighting, potable water systems, electrical power systems, sanitation facilities, barriers, and static grounds for aircraft. Note: based on 72 hour reception and 1100-man beddown.

Convoy Package. An "equipment only" UTC which (when combined with TEAM 2) gives TEAM the capability to "convoy with organic equipment up to 100 miles."

Enhanced CE support. A separate UTC that is used to enhance TEAM's 2 capability as follows: (1) Concrete mobile operations, (2) Facility hardening and revetment erection, (3) Explosive demolition, (4) Rapid runway repair, (5) Well drilling operations

Heavy Repair Echelon. Performs heavy bomb damage repair, utility system expansion/development, Harvest Eagle/Bare erection, Rapid runway repair, and may be combined with TEAMS 5,6, or 7.

Well Drilling Equipment. Well drilling equipment only UTC. Enhances capability of TEAM 4.

Paving Equipment. Paving equipment only UTC. Enhances capability of TEAM 4.

Quarry Equipment. Quarry equipment only UTC. Enhances capability of TEAM 4.

OPTION 2

Dual structure to support to support (1) theater prepositioning and (2) contingency response.

STRUCTURE #1: A single UTC composed only of personnel to support theater Oplans which are based on prepositioned assets. The UTC would contain distinct echelons designed for deployment. Response times were unspecified.

STRUCTURE #2: Small task UTCs designed only for crisis planning and composed of personnel and organic equipment "for contingency response." Teams would be able to deploy separately or in combination. The teams would be built around the following tasks:

1. Airfield lighting installation
2. Aircraft arresting system installation
3. Grounding point and power check pad installation; surface clearing and striping
4. Asphalt paving
5. Airfield assessment and beddown planning
6. Explosive demolition
7. Unit beddown; Harvest Bare and Harvest Eagle erection; shower and latrine facility erection and operation
8. Field dispensary
9. Water purification
10. Field messing with mobile kitchen
11. Water well drilling
12. Materials Testing
13. Mobile Concrete operations

Response times and actual team organization (people and equipment) were unspecified.

OPTIONs 3, 4, and 5

The next few pages are copies of three options designed by the readiness branch of one of the major commands.

NOTE: The following is a partial reproduction of the draft study put together by Senior Master Sergeant James Anderson, PACOPS/DEO.

REORGANIZATION OF 554TH CESHR-

RAPID RESPONSE FLIGHT -RRF

DEPLOYMENT PACKAGES

OVERVIEW

Recently, because of budget cuts; the move AF wide to do our business smarter; and the TAF/DEs initiatives to make RED HORSE squadrons world wide more responsive to the needs of their supported CINCs; we have developed this attached proposal as a possible solution. This attachment does not propose any additional equipment, but a rearrangement and reallocation of some existing equipment to better serve the needs of the squadron. In the past, the "RH" deployment system has been the norm. This method of deployment has been broke for a long time, therefore, in need of a permanent fix. There are many ways to divide existing RH assets to meet the needs and in Options I & II, we have delineated three. However, the attached, we believe are the most sound and request your guidance.

PREFACE

The basic RED HORSE squadron will remain at 400 personnel. This will be loaded into the JDA/JDS data base. In Option I & II, each HORSE unit, with existing manning and equipage is capable of fielding 4 each rapid response force packages, called Rapid Response Flights (RRFs). In addition, there will be a RED HORSE Support Flight (RHSF) that will remain in garrison to support projects in and around the garrison area. In addition the RHSF will contain all the specialized AFSCs unique to the HORSE such as Med Techs, Financial Management, and Safety and the unique capabilities such as well drilling, concrete mobile operations, and RRR. These special capabilities will be packaged along with flight augmenting force packages to enhance the capabilities of the deployed RRF's. In addition, the RHSF will contain squadron augmentees of Liquid Fuels Maintenance, Physician, and Disaster Preparedness Technician. The basic premise for the use of personnel and equipment is a balanced and survivable force capable of all skills. It must be understood that the capability to move the entire HORSE to support the CINC and the command remains available for whatever contingency. Bottom line, we have developed a simple deployment/employment package capable of the same mission as the total unit. "A HEAVY PRIME BEEF", sounds like a contradiction in terms, however, RED HORSE, in its conceptual stages was an outgrowth of predominately vertical and predominately horizontal flights designed for the accomplishment of specific "training" projects. This option does not add or detract from unit capability, but delineates finite and specific construction capabilities.

CONDITIONS

The deployment/employment of the RRFs are formatted to respond to theater contingencies both on a pre-planned and unplanned basis. they can respond to natural disasters, construction projects, and other contingencies as directed. the computerized deployment system (COMPES) and all associated systems will have the basic 400 person RED HORSE unit and its logistical tail loaded as the data base. Although, each HORSE is capable of deploying 4 similar or skill specific RRFs, we recommend 1 RRF be "on the ready line" at any given time for contingency purposes, with a second RRF "in the barrel." By using the RRF packages, both peacetime and wartime contingencies can be met. Tailoring of the Logistics system (COMPES Phase IV) is now available and capable of accommodating force packaging of the RRFs. The system is user friendly and should be of great help to us both in HORSE and BEEF. Successful force packaging of the HORSE in this manner, will give us the best of all possible combination. A HORSE that is mobile, skill specific, construction oriented, and light.

OPTION I

75-PERSON PACKAGE
RAPID RESPONSE FLIGHT PACKAGE
A TYPICAL RRF CONSISTS OF THE FOLLOWING:

PERSONNEL

055XX- CIV ENG OFF- 2	551XX- P, G & E - 25	566XX - SAMIT - 1
5XXXX- SUPER - 1	552XX- STRUCTURAL - 19	623XX - SERVICES - 3
542XX- ELECTRICAL - 7	553X0- SITE DEV - 3	645XX - SUPPLY - 2
545XX- MECHANICAL - 2	555X0- PROD CONT - 1	702XX - ADMIN - 2

TOTAL RRF PERSONNEL PACKAGE = 75 PERSONNEL.

VEHICLES

10 TON TRACTOR - 1	M-35 2.5 TON TRUCK - 4	PICKUP 6 PAX - 2
PICKUP, 3 PAX - 4	10 TON DUMP TRUCK - 1	20 TON DUMP TRUCK - 2
20 TON DUMP TRUCK- 2	1.5 TON TRAILER - 2	30FT VAN TRAILER - 1
25T L/B TRAILER - 1	50T L/B TRAILER - 1	2.5CY LOADER W/QC - 2
GRADER SIZE 2 - 2	DOZER SIZE 7 - 2	

TOTAL RRF VEHICLE PACKAGE = 27 PIECES.

EQUIPMENT

GENERATOR 5 KW - 2	FLOODLIGHT SET NF1 - 2	COMPRESSOR MC-7 - 2
WELD & CUT SETS - 1	RECIPROCATING PUMPS- 1	JACKHAMMERS - 2
TENTS, 16X32' - 8	FIELD SHOWER UNITS - 2	500GL FUEL BLADDER - 1
THEODOLITE - 1	RADIOS PORT & BASE- 4	TENT LIGHTING SET - 1
MOB BAGS - 75	WEAPONS -75	AMMUNITION - AS REQ
RATIONS - AS REQ	WATER BUFFALOS - 2	HAF RADIOS - 1

TOTAL RRF EQUIPMENT PACKAGE = AS LISTED ABOVE.

ADVON ELEMENT

Each flight will have a 5-person ADVON Element capable of site survey and planning factors for flight employment.

Each ADVON Element will be equipped with one 6-PAX vehicle. sit development and site analysis equipment and personnel protective equipment. Timing for this ADVON element will be reflected in the proper deployment phasing attachment to this package.

OPTION I

C E R H S

FORCE MODULE PACKAGE

75-PERSON PACKAGE

Basis of this proposal is the 400 person RED HORSE squadron UTC with five (5) force modules. Below are listed the manpower breakouts for the individual packages.

A-FLIGHT (DEPLOY) (RRF-A)		B-FLIGHT (DEPLOY) (RRF-B)		C-FLIGHT (DEPLOY) (RRF-C)		D-FLIGHT (DEPLOY) (RRF-D)		E-FLIGHT (SUPPORT) (RHSF)			
5516	1	5516	1	5525G	1	5525F	1	A05516	1	64500	1
5525C	1	5525C	1	5525C	1	5525C	1	5525A	1	64570	1
54299	1	54599	1	55299	1	55299	1	6616	1	64550	1
54270	1	54270	1	54270	1	54270	1	A07024	1	64530	1
54250	2	54250	2	54250	2	54250	2	5525E	2	64571	1
54230	1	54230	1	54230	1	54230	1	5525G	2	66170	1
54251	1	54251	1	54271	1	54251	1	10090	1	67251	1
54231	1	54231	1	54231	1	54231	1	24170	1	67273	1
54252	1	54252	1	54252	1	54252	1	42770	1	70270	1
54550	1	54550	1	54550	1	54550	1	42750	1	75172	1
54572	1	54552	1	54552	1	54532	1	54271	1	90270	1
55170	1	55170	1	55170	1	55170	1	54251	1	47200	1
55150	4	55150	4	55150	4	55150	4	54272	2	47271	2
55130	2	55130	2	55130	2	55130	2	54252	1	47250	1
55171	2	55171	2	55171	2	55171	2	55232	1	47275	1
55151	12	55151	12	55151	12	55151	12	55100	1	47274	1
55131	4	55131	4	55131	4	55131	4	55199	1	47234	1
55270	2	55270	2	55270	2	55270	2	55170	1	47253	1
55250	9	55250	9	55250	9	55250	9	55150	4		
55230	2	55230	2	55230	2	55230	2	55130	3		
55252	2	55252	2	55252	2	55252	2	55171	3		
55232	1	55232	1	55232	1	55232	1	55151	11		
55255	2	55255	2	55255	2	55255	2	55131	3		
55235	1	55235	1	55235	1	55235	1	55200	1		
55370	1	55370	1	55370	1	55370	1	55250	3		
55350	2	55350	2	55350	2	55350	2	55230	10		
56671	1	56651	1	56631	1	55330	1	55272	1		
62350	2	62350	2	62350	2	56651	1	55252	1		
62330	1	62330	1	62330	1	62350	2	55275	2		
64550	1	64550	1	64550	1	62330	1	55255	3		
64551	1	64551	1	64551	1	64550	1	55300	1		
47271	1	47271	1	47271	1	64531	1	55590	1		
47250	3	47250	3	47250	3	47271	1	55530	1		
47230	2	47230	2	47230	2	47250	3	56650	1		
55570	1	55570	1	55570	1	47230	2	60370	1		
70250	2	70250	1	70250	1	55550	1	62350	2		
47252	1	70230	1	70230	1	70250	1	62370	2		
		47252	1	47252	1	70230	1				
						47231	1				
TOTAL	75	TOTAL	75	TOTAL	75	TOTAL	75	TOTAL		100	

OPTION I

75-PERSON PACKAGE

C E R H S

RECAP RAPID RESPONSE FLIGHT (RRF) AND RED HORSE SUPPORT FLIGHT (RHSF)

AFSC/SPECIALTY	R R F MOBILITY FLIGHTS A	B	C	D	RHSF (E) FLIGHT	TOTAL ASSETS
5516/ CIVIL ENGINEERING STAFF	1	1			1	3
5525X/ CIVIL ENGINEER	1	1	2	2	5	11
6616/ LOGISTICS PLANNER					1	1
7024/ EXECUTIVE OFFICER					1	1
10090/ FIRST SERGEANT					1	1
542XX/ ELECTRICAL	7	7	7	7	7	35
545XX/ MECHANICAL	2	2	2	2		8
5XXXX/ SUPERINTENDENT	1	1	1	1		4
551XX/ PAVE, EQUIP, & GRNDS	25	25	25	25	26	126
552XX/ STRUCTURAL	19	19	19	19	21	97
553XX/ SITE DEVELOPMENT	3	3	3	3	1	13
555X0/ PROD CONT	1	1	1	1	2	6
566X0/ SANITATION	1	1	1	1	1	5
623XX/ BASE SERVICES	3	3	3	3	4	16
645XX/ SUPPLY	2	2	2	2	5	13
702XX/ ADMINISTRATION	2	2	2	2	2	10
472XX/ VEHICLE MAINTENANCE	7	7	7	7	10	38
241X0/ SAFETY					1	1
427X0/ MACHINIST					2	2
661X0/ LOGISTICS PLANNERS					2	2
751X2/ TRAINING					2	2
902X0/ MEDICAL TECHNICIAN					2	2
672XX/ FINANCIAL MANAGEMENT					2	2
603X0/ VEHICLE DISPATCH					1	1
TOTALS	75	75	75	75	100	400

OPTION I

75-PERSON PACKAGE

RAPID RESPONSE FLIGHT (RRF) AND RED HORSE SUPPORT FLIGHT (RHSF)

TEAM	WEIGHT(LBS)	VEHS	PERS	REMARKS
RRF-A *	230,000**	26	70	54 HOURS
RRF-A-ADV	20,000**	1	5	18 HOURS
RRF-B *	230,000**	26	70	78 HOURS
RRF-B-ADV	20,000**	1	5	42 HOURS
RRF-C *	230,000**	26	70	102 HOURS
RRF-C-ADV	20,000**	1	5	18 HOURS
RRF-D *	230,000**	26	70	126 HOURS
RRF-A-ADV	20,000**	1	5	90 HOURS
RHSF	1,500,000**	95	100	30 DAYS

* EACH FLIGHT WILL BE AN INTEGRAL PART OF TOTAL HORSE. HOWEVER, ONLY ONE RAPID RESPONSE FLIGHT (RRF) WILL BE ON CALL AT ANY ONE TIME. THERE DOES EXIST THE POSSIBILITY THAT DUE TO THE CONSTRUCTION SCHEDULE MORE THAN ONE OF THE RRFS CAN BE DEPLOYED AT ONE TIME.

** THIS IS AN ESTIMATE, ACTUAL WEIGHTS WILL BE CALCULATED UPON APPROVAL OF CONCEPT.

OPTION II

65-PERSON PACKAGE
RAPID RESPONSE FLIGHT PACKAGE
A TYPICAL RRF CONSISTS OF THE FOLLOWING:

PERSONNEL

055XX- CIV ENG OFF- 2	551XX- P, G & E - 21	566XX - SANIT - 2
5XXXX- SUPER - 1	552XX- STRUCTURAL - 18	623XX - SERVICES - 3
542XX- ELECTRICAL - 7	553X0- SITE DEV - 3	645XX - SUPPLY - 2
545XX- MECHANICAL - 2		
472XX- VEH MAINT - 5		

TOTAL RRF PERSONNEL PACKAGE = 65 PERSONNEL.

VEHICLES

10 TON TRACTOR - 1	M-35 2.5 TON TRUCK - 4	PICKUP 6 PAX - 2
PICKUP, 3 PAX - 4	10 TON DUMP TRUCK - 1	20 TON DUMP TRUCK - 2
20 TON DUMP TRUCK- 2	1.5 TON TRAILER - 2	30FT VAN TRAILER - 1
35T L/B TRAILER - 1	50T L/B TRAILER - 1	2.5CY LOADER W/QC - 2
GRADER SIZE 2 - 2	DOZER SIZE 7 - 2	

TOTAL RRF VEHICLE PACKAGE = 27 PIECES.

EQUIPMENT

GENERATOR 5 KW - 2	FLOODLIGHT SET MP1 - 2	COMPRESSOR MC-7 - 2
WELD & CUT SETS - 1	RECIPROCATING PUMP - 1	JACKHAMMERS - 2
TENTS, 16X32' - 7	FIELD SHOWER UNITS - 2	500GL FUEL BLADDER - 1
THEODOLITE - 1	RADIOS PORT & BASE- 4	TENT LIGHTING SET - 1
MOB BAGS - 65	WEAPONS -65	AMMUNITION - AS REQ
RATIONS - AS REQ	WATER BUFFALOS - 2	HAF RADIOS - 1

TOTAL RRF EQUIPMENT PACKAGE = AS LISTED ABOVE.

ADVON ELEMENT

Each flight will have a 5-person ADVON Element capable of site survey and planning factors for flight employment.

Each ADVON Element will be equipped with one 6-PAX vehicle. sit development and site analysis equipment and personnel protective equipment. Timing for this ADVON element will be reflected in the proper deployment phasing attachment to this package.

OPTION II

C E R H S

FORCE MODULE PACKAGE

65-PERSON PACKAGE

Basis of this proposal is the 400 person RED HORSE squadron UTC with five (5) force modules. Below are listed the manpower breakouts for the individual packages.

A-FLIGHT (DEPLOY) (RRF-A)		B-FLIGHT (DEPLOY) (RRF-B)		C-FLIGHT (DEPLOY) (RRF-C)		D-FLIGHT (DEPLOY) (RRF-D)		E-FLIGHT (SUPPORT) (RHSF)			
5516	1	5516	1	5525G	1	5525F	1	A05516	1	64500	1
5525C	1	5525C	1	5525C	1	5525C	1	5525A	1	64570	1
55100	1	55199	1	55299	1	55299	1	6616	1	64550	1
54270	1	54270	1	54270	1	54270	1	A07024	1	64530	1
54250	2	54250	2	54250	2	54250	2	5525E	2	64571	1
54230	1	54230	1	54230	1	54230	1	5525G	2	66170	2
54251	1	54251	1	54271	1	54251	1	10090	1	67251	1
54231	1	54231	1	54231	1	54231	1	24170	1	67273	1
54252	1	54252	1	54252	1	54252	1	42770	1	70270	2
54550	1	54550	1	54550	1	54550	1	42750	1	70250	5
54572	1	54552	1	54552	1	54532	1	54271	1	70230	2
55170	1	55170	1	55170	1	55170	1	54251	1	71572	2
55150	4	55150	4	55150	4	55150	4	54272	2	90270	2
55130	2	55130	2	55130	2	55130	2	54252	1	47200	1
55171	2	55171	2	55171	2	55171	2	55232	1	47271	3
55151	10	55151	10	55151	10	55151	10	55100	1	47250	5
55131	2	55131	2	55131	2	55131	2	55199	1	47275	1
55270	2	55270	2	55270	2	55270	2	55170	1	47274	1
55250	8	55250	8	55250	8	55250	8	55150	4	47234	2
55230	2	55230	2	55230	2	55230	2	55130	3	47253	2
55252	2	55252	2	55252	2	55252	2	55171	3	47252	3
55232	1	55232	1	55232	1	55232	1	55151	19	47251	1
55255	2	55255	2	55255	2	55255	2	55131	10		
55235	1	55235	1	55235	1	55235	1	55200	1		
55370	1	55370	1	55370	1	55370	1	55250	7		
55350	2	55350	2	55350	2	55350	1	55230	10		
56671	1	56651	1	56631	1	55330	1	55272	1		
62350	2	62350	2	62350	2	56651	1	55252	1		
62330	1	62330	1	62330	1	62350	2	55275	3		
64550	1	64550	1	64550	1	62330	1	55255	3		
64551	1	64551	1	64551	1	64550	1	55300	1		
47271	1	47271	1	47271	1	64531	1	55590	1		
47250	2	47250	2	47250	2	47271	1	55570	3		
47230	2	47230	2	47230	2	47250	2	55550	1		
						47230	2	55530	1		
								56650	1		
								60370	1		
								62350	2		
								62370	2		
TOTAL	65	TOTAL	65	TOTAL	65	TOTAL	65	TOTAL			140

OPTION II

65-PERSON PACKAGE

C E R H S

RECAP RAPID RESPONSE FLIGHT (RRF) AND RED HORSE SUPPORT FLIGHT (RHSF)

AFSC/SPECIALTY	R R F MOBILITY FLIGHTS				RHSF (E) FLIGHT	TOTAL ASSETS
	A	B	C	D		
5516/ CIVIL ENGINEERING STAFF	1	1			1	3
5525X/ CIVIL ENGINEER	1	1	2	2	5	11
6616/ LOGISTICS PLANNER					1	1
7024/ EXECUTIVE OFFICER					1	1
10090/ FIRST SEARGENT					1	1
542XX/ ELECTRICAL	7	7	7	7	7	35
545XX/ MECHANICAL	2	2	2	2		8
5XXXX/ SUPERINTENDENT	1	1	1	1		4
551XX/ PAVE, EQUIP, & GRNDS	21	21	21	21	42	126
552XX/ STRUCTURAL	18	18	18	18	25	97
553XX/ SITE DEVELOPMENT	3	3	3	3	1	13
555X0/ PROD CONT					6	6
566X0/ SANITATION	1	1	1	1	1	5
623XX/ BASE SERVICES	3	3	3	3	4	16
645XX/ SUPPLY	2	2	2	2	5	13
702XX/ ADMINISTRATION					10	10
472XX/ VEHICLE MAINTENANCE	5	5	5	5	18	38
241X0/ SAFETY					1	1
427X0/ MACHINIST					2	2
661X0/ LOGISTICS PLANNERS					2	2
751X2/ TRAINING					2	2
902X0/ MEDICAL TECHNICIAN					2	2
672XX/ FINANCIAL MANAGEMENT					2	2
603X0/ VEHICLE DISPATCH					1	1
TOTALS	65	65	65	65	140	400

OPTION II

65-PERSON PACKAGE

RAPID RESPONSE FLIGHT (RRF) AND RED HORSE SUPPORT FLIGHT (RHSF)

TEAM	WEIGHT(LBS)	VEHS	PERS	REMARKS
RRF-A *	230,000**	26	60	54 HOURS
RRF-A-ADV	20,000**	1	5	18 HOURS
RRF B *	230,000**	26	60	78 HOURS
RRF-B-ADV	20,000**	1	5	42 HOURS
RRF-C *	230,000**	26	60	102 HOURS
RRF-C-ADV	20,000**	1	5	18 HOURS
RRF-D *	230,000**	26	60	126 HOURS
RRF-A-ADV	20,000**	1	5	90 HOURS
RHSF	1,500,000**	95	140	30 DAYS

* EACH FLIGHT WILL BE AN INTEGRAL PART OF TOTAL HORSE. HOWEVER, ONLY ONE RAPID RESPONSE FLIGHT (RRF) WILL BE ON CALL AT ANY ONE TIME. THERE DOES EXIST THE POSSIBILITY THAT DUE TO THE CONSTRUCTION SCHEDULE MORE THAN ONE OF THE RRFS CAN BE DEPLOYED AT ONE TIME.

** THIS IS AN ESTIMATE, ACTUAL WEIGHTS WILL BE CALCULATED UPON APPROVAL OF CONCEPT.

OPTION III

RECAP HORIZONTAL CONSTRUCTION CAPABILITY

PERSONNEL

055XX- CIV ENG OFF- 2	551XX- P, G & E - 40
5XXXX- SUPER - 1	623XX - SERVICES - 3
553X0- SITE DEV - 3	472XX- VEH MAINT - 7

TOTAL RRF PERSONNEL PACKAGE = 56 PERSONNEL.

VEHICLES

M-35 2.5 TON TRUCK - 2	PICKUP 6 PAX - 1	GRADER SIZE 2 - 2
PICKUP, 3 PAX - 2	10 TON DUMP TRUCK - 2	20 TON TRACTOR - 4
20 TON DUMP TRUCK - 4	1.5 TON TRAILER - 1	DOZER SIZE 7 - 2
35T L/B TRAILER - 1	50T L/B TRAILER - 1	2.5CY LOADER W/QC - 2

TOTAL RRF VEHICLE PACKAGE = 34 PIECES.

EQUIPMENT

GENERATOR 5 KW - 2	FLOODLIGHT SET MF1 - 2	COMPRESSOR MC-7 - 2
WELD & CUT SETS - 1	RECIPROCATING PUMPS- 2	
TENTS, 16X32' - 6	FIELD SHOWER UNITS - 2	500GL FUEL BLADDER - 1
THEODOLITE - 1	RADIOS PORT & BASE- 4	TENT LIGHTING SET - 1
MOB BAGS - 168	WEAPONS -56	AMMUNITION - AS REQ
RATIONS - AS REQ	WATER BUFFALOS - 2	HAF RADIOS - 1

TOTAL RRF EQUIPMENT PACKAGE = AS LISTED ABOVE.

OPTION III

RECAP VERTICAL CONSTRUCTION CAPABILITY

PERSONNEL

055XX- CIV ENG OFF- 2
5XXXX- SUPER - 1
542XX- ELECTRICAL -14
545XX- MECHANICAL - 4
472XX- VEH MAINT - 3
566XX- SANIT - 2
623XX- SERVICES - 3
553X0- SITE DEV - 3
552XX- STRUCTURAL - 28
645XX- SUPPLY - 4

TOTAL RRF PERSONNEL PACKAGE = 64 PERSONNEL.

VEHICLES

10 TON TRACTOR - 2
PICKUP, 3 PAX - 6
1.5 TON TRAILER - 3
M-35 2.5 TON TRUCK - 2
PICKUP, 6 PAX - 3
30T VAN TRAILER - 2

TOTAL RRF VEHICLE PACKAGE = 22 PIECES.

EQUIPMENT

GENERATOR 5 KW - 2
TENTS, 16X32' -10
THEODOLITE - 1
MOB BAGS - 192
RATIONS - AS REQ
FLOODLIGHT SET MF1 - 2
FIELD SHOWER UNITS - 2
RADIOS PORT & BASE- 4
WEAPONS -64
WATER BUFFALOS - 2
WELD & CUT SETS - 1
500GL FUEL BLADDER - 1
TENT LIGHTING SET - 1
AMMUNITION - AS REQ
HAF RADIOS - 1

TOTAL RRF EQUIPMENT PACKAGE = AS LISTED ABOVE.

OPTION III

RAPID RESPONSE FLIGHT AND RED HORSE SUPPORT FLIGHT

HORIZONTAL AND VERTICAL CONSTRUCTION CAPABILITIES

AFSC/SPECIALTY	RRF MOBILITY FLIGHTS				RHSF (E) FLIGHT	TOTAL ASSETS
	A	B	C	D		
5516/ CIVIL ENGINEERING STAFF	1	1			1	3
5525X/ CIVIL ENGINEER	1	1	2	2	5	11
6616/ LOGISTICS PLANNER					1	1
7024/ EXECUTIVE OFFICER					1	1
10090/ FIRST SEARGENT					1	1
542XX/ ELECTRICAL			14	14	7	35
545XX/ MECHANICAL			4	4		8
5XXXX/ SUPERINTENDENT	1	1	1	1		4
551XX/ PAVE, EQUIP, & GRNDS	40	40			46	126
552XX/ STRUCTURAL			28	28	41	97
553XX/ SITE DEVELOPMENT	3	3	3	3	1	13
555X0/ PROD CONT					6	6
566X0/ SANITATION			2	2	1	5
623XX/ BASE SERVICES	3	3	3	3	4	16
645XX/ SUPPLY			4	4	5	13
702XX/ ADMINISTRATION					10	10
472XX/ VEHICLE MAINTENANCE	7	7	3	3	18	38
241X0/ SAFETY					1	1
427X0/ MACHINIST					2	2
661X0/ LOGISTICS PLANNERS					2	2
751X2/ TRAINING					2	2
902X0/ MEDICAL TECHNICIAN					2	2
672XX/ FINANCIAL MANAGEMENT					2	2
603X0/ VEHICLE DISPATCH					1	1
TOTALS	56	56	64	64	160	400

OPTION III

VERTICAL AND HORIZONTAL CONSTRUCTION CAPABILITY

TEAM	WEIGHT(LBS)	VEHS	PERS	REMARKS
RRF-H-A *	450,000**	34	56	54 HOURS***
RRF-H-B *	450,000**	34	56	78 HOURS***
RRF-V-A *	150,000**	22	62	54 HOURS***
RRF-V-B *	150,000**	22	62	78 HOURS***
RHSF	1,500,000**	95	164	30 DAYS

* EACH FLIGHT WILL BE AN INTEGRAL PART OF TOTAL HORSE.

** THIS IS AN ESTIMATE, ACTUAL WEIGHTS WILL BE CALCULATED UPON APPROVAL OF CONCEPT.

*** THIS IS SAMPLE TIMING, ACTUAL TIMES WILL BE INSPIRED AS DEVELOPMENT OF THE PACKAGE OCCURS. CONSEQUENTLY, HORIZONTAL AND VERTICAL PACKAGES MAYBE DEPLOYED INDEPENDENTLY OR AS A WHOLE, BUT NOT SIMULTANEOUSLY. THESE PACKAGES STILL REQUIRE DEPLOYMENT INTEGRITY. IF DEPLOYED AS A PACKAGE, THEN THE DEPLOYMENT TIMING OF 24 HOURS BETWEEN HORIZONTAL AND VERTICAL PORTIONS MUST BE MAINTAINED.

Appendix B: Summary of Responses

AREA 1: YOUR EXPERIENCE

1. In what jobs and units were you assigned to that added to your experience with RED HORSE? How long were you in each?

(a) Contingency planner, MAJCOM readiness staff
(b) Vietnam (4 years), MAJCOM readiness staff
(c) 7219 CERHF/CC (3 years)
(d) Chief Ops Training (2 Years)
(e) Project Engineer, 554th; Chief of Ops, 823 (3 years)
(f) Chief Engineer, 820 CESHR (2 years)
(g) Site Developer, Vietnam (1 year); 823rd (4 years)
(h) HQ TAC (1.5 years)
(i) Eng. Asst. Manager, 200 CERHS (since 1975)

2. What studies, working groups, or reports were you involved with that dealt with RED HORSE force structures?

(a) RH ConOps, E&S doctrine, RH commander's conferences
(b) RH Steering Committee
(c) Thesis on Prepositioning of RH assets
(d) None
(e) RELOOK
(f) None
(g) RELOOK
(h) None
(i) Informal Review of team member structuring.

AREA 2: HISTORICAL PERSPECTIVE

3. If you are familiar with the historical development of RED HORSE during the Vietnam Conflict (either through actual involvement or through historical readings) state whether you believe RED HORSE was intended (designed) for inter-theater mobility, intra-theater mobility, or both. Explain.

(a) Never designed for mobility (rapid response) to the majority of the DOC.
(b) "Both, it is my firm and steadfast belief . . . the HORSE can do both missions with ease."
(c) Not originally designed for inter-theater; changes were made after Vietnam
(d) "At first RED HORSE was intended only for intra-theater mobility with over the road transportation. Its size (manning and equipment) did not and does not permit rapid deployment of the unit as a whole."

(e) Never designed for mobility. First came up around '73.
(f) Both.
(g) No answer.
(h) Not familiar with the history.
(i) "With the existing size and weight of the RED HORSE package (RH-1,2,3), it is hard to see it as anything but an intra-theater operation.

4. The unit histories of RED HORSE units which operated in Vietnam suggest that contingency deployments were never accomplished or intended to be accomplished under a three echelon system such as the RH-1, 2, and 3 concept. What is your opinion of this assessment?

(a) True, they were designed for deployment of entire units to set up bare bases and follow on construction.
(b) "Agree!! The size was always right, however, in my opinion the packaging or UTC/echelon construction never fit the need."
(c) Agree--"not intended to accomplish work under a three echelon system."
(d) "No comment."
(e) Agree
(f) "I agree, the HORSE must be able to break up into smaller teams to perform various scopes of work, though a "support" tail highly determines the HORSE's capability to sustain in various scenarios."
(g) "RH-1, 2, and 3 were convenient packages established for LGX's benefit. As far as I know the units were tasked and deployed the same way we accomplish our day to day taskings now."
(h) "Unknown, but is does seem almost impossible..."
(i) "Agreed, time limitations (long duration) almost eliminate the RH-3 force from ever seeing the theater of operation."

AREA 3: FORCE STRUCTURE DESIGN

5. As the mobility teams are currently configured, do you believe the mission of RED HORSE should be designed primarily around inter-theater deployments, intra-theater deployments, or both? Please explain.

(a) Intra-theater deployments because of limited transportation. reason for prepositioning.
(b) Inter-theater in conjunction with dual flag basing and prepositioning.
(c) Both
(d) "Theater deployed units such as the 554th at Osan or the 819th in UK should only be designed to be theater mobile. But, given the size of PACAF (PACOM) and

Europe, the logistics required to transport them intra-theater would be the same or almost the same as inter-theater mobility."

(e) As configured, inter-theater mobility, but then most of this will be influenced by the nature of the war and the engineering requirements. CONUS units should have the ability to deploy overseas. Theater based units must have convoy capability. The criteria that is currently applied to RED HORSE units is inappropriate.

(f) As currently configured we are better prepared for inter-theater deployments. Our convoy moving capabilities are inadequate.

(g) Both.

(h) Intra-theater

(i) Intra-theater

6. Air Force sponsored studies and reports suggest another more appropriate force module structure might be divided along the same lines as the disciplines required for construction. For example, all AFSCs needed for horizontal construction capability might be grouped in one or several smaller mobility teams and the same could be done for vertical construction capability, administrative support, medical support, etc.... What is your assessment of this suggested configuration?

(a) "Force modules should support small packages for special capabilities. Packaged for Horizontal or Vertical construction, to be effective they must be pretty large, otherwise they provide only token capability. Just not practical. 400-man RH is only half of an 800+ Army construction battalion."

(b) Division of RH capabilities should ". . . be maintained in some semblance of the original configuration." The RH/CC and the supported theater CINC should decides what capabilities are needed.

(c) "Sounds like putting all your eggs in one basket." This concept lacks flexibility--personnel should be multi-skilled.

(d) "I do not agree. Contingency responses will not be geared toward strictly horizontal or vertical work. There is no way to predict what type of repair work would be necessary in the event of a contingency of war. After all their primary mission is not peacetime construction but contingency/war damage repair."

(e) Disagree. No flexibility. Inappropriate for a CONUS based unit because you don't really know what the mission is going to be.

(f) "I agree we must be able to mobilize in a matrix system."

(g) "The above concept appears very plausible; however, practically all vertical projects require at least some horizontal work. By far the most accurate means

of getting the right number of workers on the job is to define the scope of the work and allowing RED HORSE to fill the positions."

(h) "More so than that, personnel should be multi-skilled in lieu of single skilled qualified."

(i) "Teams need to be suited to the current situation requirements. There will never be two situations with the same exact requirements. The ability to evaluate and fill those requirements with the disciplines is the key. Otherwise, have the RH-1, "go look team". evaluate the needs and respond with the requirements."

7. In light of the amount of contract construction accomplished in the Vietnam Conflict, should RED HORSE be given a contracting capability to be employed in similar environments?

(a) Yes, in fact we are providing one each SMSgt contracting authorization to active units for this purpose. We have approval; manpower is working slots.

(b) Yes, the capability was there in Vietnam but it was lost sometime after 1974.

(c) Yes

(d) "I'm not sure what is being asked here."

(e) Yes.

(f) No answer.

(g) Yes.

(h) "Not sure of this question."

(i) "Yes, local manpower is a vital resource."

8. What would you say are the most important factors that should be considered in the design of RED HORSE force modules? Choose any of the following or provide others.

- Doctrine, designated unit mission
- Generic contingency engineering support requirements (for all theaters)
- Potential threat
- Support needs
- Theater specific requirements

(a) "Not sure any factor is as important as a <u>hierarchy</u> of factors, starting with doctrine."

(b) Theater specific requirements and generic skills.

(c) In order of most to least--threat, theater specific requirements, generic requirements, doctrine, and support needs; will probably be determined by the theater ConOps.

(d) "Theater specific contingency/war damage repair."

(e) All are important, but the differences of each theater must also be considered. We need to also consider the

complimentary roles of Prime BEEF and RED HORSE.
[What it really boils down to is doctrine.]

(f) Potential threat and support needs.

(g) Generic requirements and threat.

(h) Potential threat, Support needs, Theater specific requirements

(i) "Identify requirements (per theater); identify mission definition to fulfill requirements."

9. If lighter, smaller force modules are developed, should they be independent of each other (in terms of capability, self-sufficiency, logistics support, etc...)? What other factors should be considered?

(a) "Force modules should be built around critical special capabilities like well drilling, ... asphalt paving may be too large. Force modules should be self-sufficient with resupply of consumables including such things as well casings."

(b) Should be self-sufficient and self-capable but this could be accomplished as in options 3-5.

(c) Yes. "Unfortunately, this concept is very much like the troubled Prime BEEF teams from the mid 1980's." It may be efficient but it may not be as effective.

(d) "If smaller, lighter force modules are developed, they should be self-sufficient for short periods of time until reinforcements arrive. This will give one RED HORSE unit the flexibility to respond to more than one contingency at the same time."

(e) The degree of self-sufficiency will depend on the nature of the war and the theater requirements, e.g., dispersed operations. In a big war, RED HORSE should not deliberately set themselves up to be fragmented. The capability will be diluted. In emergency/crisis action planning situations, a task organization would probably be very appropriate.

(f) Yes. Other factors include location and duration of deployment; these factors will determine the support tail.

(g) "Smaller force modules would be a tremendous benefit in getting the right kinds and numbers of construction troops to critical jobs. However, the war planners must be knowledgeable of the force module capabilities and the job requirements. The force modules could be made lighter (dependent on host base support) but develop a stand alone package for deployment into unsupported contingencies."

(h) No answer.

(i) "From past experience, for all the effort that was and is put into aligning the RH units, only to a degree has it been accomplished. This caused by the

government buying systems, climate of each RH location, and the local interpretation of important issues that govern the HORSE."

10. Significant portions of RH-2 could be made deployable before 48-hours but will deploy based on airflow schedules. The airflow schedule also impacts the arrival time and sequence at the port of debarkation. Under such circumstances, each scenario might dictate that some capabilities (assets) arrive and generate sooner than others. If you were tasked with determining what was needed first at the deployed location, what priorities (for deployment) would you assign to each capability under the three scenarios listed below? Use "1" for highest priority and list any other capabilities that might apply.

I. Tasked for Bare Base Operations (Force Beddown)

II. Tasked for Heavy Bomb Damage Repair

III. Tasked for Expedient Construction

(List the priorities under the number for each scenario)

SCENARIO

I	II	III	
			- Security Defense (Weapons/Ammo)
			- Earth Moving Capabilities
			- Vertical Construction Capabilities
			- Horizontal Construction Capabilities (Concrete and Asphalt paving)
			- Well Drilling (water production)
			- Quarry Ops
			- Material Testing
			- Barrier Installation
			- Other (give name)

(a) (If two answers are given under Scenario II, the first is for RRR, the second is for Facilities and utilities. Under Scenario III, the first is for ramps, the second--facilities, the third--drainage. NN means not needed)

1 / NN	/ NN	-	Security Defense (Weapons/Ammo)
5 / 3-NN	/ 1-1-?	-	Earth Moving Capabilities
NN / NN-3	/ ?-3-1	-	Vertical Construction Capabilities
NN / NN-2	/	-	Horizontal Construction Capabilities (Concrete and Asphalt paving)
NN / NN	/	-	Well Drilling (water production)
NN / 4-NN	/ ?-2-?	-	Quarry Ops
4 / 5-NN	/ 2-?-?	-	Material Testing
2 / 1-NN	/	-	Barrier Installation
3 / 2-NN	/	-	Other (Airfield lighting)

(Question was simplistic. Needed to specify other variables such as where, one location or multiple, convoy requirements, and type of construction.)

(b)

1 / 1	/ 1	- Security Defense (Weapons/Ammo)
4 / 3	/ 4	- Earth Moving Capabilities
3 / 4	/ 2	- Vertical Construction Capabilities
2 / 2	/ 3	- Horizontal Construction Capabilities (Concrete and Asphalt paving)
5 / 7	/ 6	- Well Drilling (water production)
7 / 5	/ 5	- Quarry Ops
6 / 6	/ 7	- Material Testing
8 / 8	/ 8	- Barrier Installation

(c)

1 / 1	/ 1	- Security Defense (Weapons/Ammo)
5 / 3	/ 4	- Earth Moving Capabilities
3 / 7	/ 7	- Vertical Construction Capabilities
8 / 6	/ 8	- Horizontal Construction Capabilities (Concrete and Asphalt paving)
4 / 8	/ 3	- Well Drilling (water production)
6 / 5	/ 5	- Quarry Ops
2 / 2	/ 2	- Material Testing
7 / 4	/ 6	- Barrier Installation

(d)

5 / 4	/ 3	- Security Defense (Weapons/Ammo)
1 / 2	/ 4	- Earth Moving Capabilities
6 / 3	/ 1	- Vertical Construction Capabilities
3 / 1	/ 2	- Horizontal Construction Capabilities (Concrete and Asphalt paving)
2 / -	/ -	- Well Drilling (water production)
4 / -	/ -	- Quarry Ops
- / 5	/ -	- Material Testing
- / -	/ -	- Barrier Installation

(e) No answer because too many factors are involved. Each situation must be separately evaluated.

(f)

1 / 1	/ 1	- Security Defense (Weapons/Ammo)
3 / 3	/ 5	- Earth Moving Capabilities
4 / 8	/ 4	- Vertical Construction Capabilities
5 / 7	/ 3	- Horizontal Construction Capabilities (Concrete and Asphalt paving)
2 / 5	/ 6	- Well Drilling (water production)
7 / 4	/ 7	- Quarry Ops
6 / 2	/ 2	- Material Testing
8 / 6	/ 8	- Barrier Installation

(g)

1 / -	/ -	- Security Defense (Weapons/Ammo)
- / 1	/ -	- Earth Moving Capabilities

- / -	/ 1	-	Vertical Construction Capabilities
- / -	/ 1	-	Horizontal Construction Capabilities (Concrete and Asphalt paving)
- / -	/ 1	-	Well Drilling (water production)
- / -	/ 1	-	Quarry Ops
- / 1	/ -	-	Material Testing
1 / -	/ -	-	Barrier Installation

(h)

1 / 4	/ 6	-	Security Defense (Weapons/Ammo)
2 / 1	/ 1	-	Earth Moving Capabilities
4 / 3	/ 3	-	Vertical Construction Capabilities
3 / 2	/ 2	-	Horizontal Construction Capabilities (Concrete and Asphalt paving)
5 / 7	/ 4	-	Well Drilling (water production)
9 / 9	/ 9	-	Quarry Ops
6 / 5	/ 7	-	Material Testing
7 / 6	/ 5	-	Barrier Installation

(i)

by threat -----		-	Security Defense (Weapons/Ammo)
4 / 1	/ 2	-	Earth Moving Capabilities
1 / 5	/ 3	-	Vertical Construction Capabilities
5 / 2	/	-	Horizontal Construction Capabilities (Concrete and Asphalt paving)
6 / 6	/	-	Well Drilling (water production)
7 / 3	/	-	Quarry Ops
3 / 3	/ 1	-	Material Testing
2 / 4	/ 4	-	Barrier Installation

AREA 4: CONTINGENCY SUPPORT CAPABILITY

11. How would you rate RED HORSE's "actual" contingency support capability against what might be required to support <u>conventional warfare</u>? Circle one number.

1	2	3	4	5	6	7
Significantly Less Than			Equal			Significantly Greater Than

(a) 6 -- assuming adequate number of RH units.
(b) 6
(c) 5
(d) 3
(e) 6 -- they do well when they get to there
(f) 3
(g) 4
(h) 6
(i) 4

12. Low intensity conflict?

1	2	3	4	5	6	7
Significantly Less Than			Equal			Significantly Greater Than

(a) 6
(b) 6
(c) 3
(d) 6
(e) 6
(f) 4
(g) 4
(h) 6
(i) 5

13. What changes would you recommend for the current capability of RED HORSE?

(a) "More training on special capabilities, individual skill & basic construction techniques."
(b) Lighter, mobile, more capability
(c) Additional vehicles to move RH within theater.
(d) "Theater manning should be increased due to the distinct possibility that some personnel may become casualties very early in a conflict and resupply of new personnel may not occur for several days."
(e) Containerized shops. Scrub TA for training versus mobilization equipment.
(f) Improvements to heavy equipment.
(g) "Update and modernize construction equipment. Enhance convoy survivability by the addition of armored vehicles."
(h) "Should go back to a mandatory 5 skill level, at least in the grade of E-4."
(i) "Realistically review taskings and capabilities. Determine if all the special capability tasking in 93-9 can be maintained. Otherwise let's not say 12 people can fly anytime - anywhere."

14. Do you agree that the most important factor which determines self-sufficiency is the capability of the logistics functions (supply, vehicle maintenance, etc...)? If not, what is the most important factor?

(a) "Self-sufficiency is a misnomer. Right now we interpret this to mean they can go anywhere, eat, sleep, and defend themselves plus [sic] resources. Without a logistic pipeline for construction material--self-sufficiency is a moot point."

(b) Agree, but the ability of the supported MAJCOM to provide supplies to RH is the key.
(c) Agree
(d) "Yes, but add services support (food services and water purification, fuel, ect..."
(e) Yes.
(f) Agree.
(g) Yes.
(h) Yes, but availability of trained personnel should also be considered.
(i) "Logistical support for self-sufficiency is vital, but if the team or personnel are not prepare - no support will help that capability."

15. In planning to conduct independent--self-sufficient--operations, which areas do you believe are not fully developed? (Example: Resupply of consumables) What recommendations do you have?

(a) Logistics pipeline for construction materials and supplies (Class IV); BOM for RH units.
(b) Contracting and prepositioning
(c) Resupply of consumables and Contracting support augmentees; European vehicles for in-theater transportation; WRSK for vehicles and equipment
(d) "Attrition of existing supplies and equipment from war damage."
(e) The plans for self-sustaining operations need some reconsideration.
(f) Equipment authorizations.
(g) No answer.
(h) Vehicle parts--WRSK, trained personnel, and personnel replacements.
(i) "If a front line soldier is periodically supplied with food, ammo, ect..., why not a member of a RED HORSE organization? We apparently need to get in the main stream of a support effort (wartime)."

16. Are the special capability teams adequate?

Place a check in the appropriate box.

YES	NO	
_____	_____	- Airfield lighting installation
_____	_____	- Communications
_____	_____	- Concrete Mobile Operations
_____	_____	- Explosive Demolition Operations
_____	_____	- Expedient Barrier Installation
_____	_____	- Material Testing
_____	_____	- Quarry Operations
_____	_____	- Bare Base Installation
_____	_____	- Water Well Drilling
_____	_____	- Disaster Preparedness Mobility Team

If inadequate, why? Training? Equipment? Manpower?

(a) All yes except Quarry Ops--needs rock crushers for all units.

(b)
no - Communications--update equipment and training
no - Expedient Barrier Installation--same
no - Quarry Operations--purchase equipment
no - Water Well Drilling--update equip. and training

(c) No answer

(d) All are adequate but materials testing and quarry ops.

(e) Not really. They all need better equipment and training. Our ability to distribute water is poor. The concrete mobile does not provide much of a capability. We should reevaluate the need for all of the capabilities because of the inability to provide strategic lift.

(f) Communications are inadequate. Concrete mobile is only good for small repairs. Materials testing needs more equipment.
(g) Could use larger equipment for concrete mobile.
(h) Quarry ops and bare base installation.

(i) no - Communications
no - Explosive Demolition Operations ("limited training")
no - Material Testing ("not sufficient schooling")
no - Quarry Operations ("seriously question equipment movement")
no - Water Well Drilling ("not sufficient professional instruction")

AREA 5: MISSION

17. What are your thoughts on any potential overlapping of responsibilities of RED HORSE and Prime BEEF?

(a) "There is a tendency to have RH perform Prime BEEF tasks." Prime should be maxed out before committing RH.
(b) No problem--some overlapping will occur because were all engineers.
(c) "Inevitable, so it shouldn't be a problem."
(d) "RED HORSE and Prime BEEF responsibilities do overlap in the areas of force beddown, utility repair, and RRR to mention a few. This is OK, However, because with the number of expected personnel and weapons systems to bed down in a contingency . . . both are going to be needed."

(e) No true problem; it is to be expected due to the nature of the skills involved.
(f) It is good because Prime BEEF personnel can be used to augment RED HORSE.
(g) "The beddown scenario . . . is just one means of getting RED HORSE to the war. RED HORSE and Prime BEEF are just sisters in a big family."
(h) "Hardly any if used properly."
(i) "There seems to be an ever increasing overlapping of responsibilities and capabilities. Both organizations need to be reevaluated and redefined to maximize engineering capabilities."

18. Should RED HORSE UTCs be tied to combat units for specific and dedicated support during contingencies?

(a) No--tie to NAF or higher.
(b) No
(c) No
(d) "No. There are took many combat units and only a few RH units. The combat unit it supports will be determined by which mission has the greatest need."
(e) No. Should be assigned for regional support.
(f) "Only if combat units are geographically assigned..."
(g) No.
(h) No.
(i) No.

19. For purposes of deliberate planning, should the taskings of RED HORSE be primarily force beddown, bomb damage repair, or heavy construction (for base upgrade)?

(a) Primarily force beddown and damage repair being careful not to do the Army's work unless they can't support.
(b) All three.
(c) All three.
(d) "Taskings for RH should be war damage repair . . ."
(e) Should be prepared to do all three.
(f) All three.
(g) "RED HORSE could be used for initial force beddown but planning should be based on heavy construction."
(h) All three.
(i) "Bomb damage repair."

20. What is your opinion of RED HORSE's role in providing perimeter security or team security?

(a) Protect their own resources but not base perimeter.
(b) The requirements should be updated IAW AFOSP regs.
(c) "Very important, well worth the training time." [Good answer--war is unpredictable.]
(d) "If RH units are self-sustaining, they may be required to provide their own security."
(e) They are not cops, but they should be ready.
(f) Need to be prepared to do all of it.
(g) "RED HORSE is not security police. The Air Force does not have enough heavy construction capability for contingencies. RED HORSE should do resource protection, work party protection, and convoy security."
(h) "Perimeter security is a bad idea." Attrition will most likely be high and costly.
(i) "Team (work crew) security is the only role that a RED HORSE unit can adequately accomplish."

21. What changes, if any, do you recommend to the concept of employment in hostile environments?

(a) "RH cannot employ in a hostile environment very effectively." Should not send a construction unit in a high risk environment because they won't be able to do construction.
(b) None
(c) Armor personnel carrier and mini guns.
(d) "None."
(e) None.
(f) "None. We just need to be more practical."
(g) No answer.
(h) "Unknown."
(i) "That RED HORSE units operate in relatively secure areas or that additional security forces be locally available."

22. Who should RED HORSE work for in wartime, i.e., flying unit commanders, regional CE commanders, etc...?

(a) NAF or higher.
(b) Theater CINCS
(c) NAF for taskings and Regional CE group for policy.
(d) NAF, ". . . too much work at various locations to assign to a flying unit commander."
(e) Regional commanders
(f) Flying unit commanders.
(g) "RED HORSE should work for the regional CE commander for construction, but should report to wing commanders during beddown contingencies."
(h) "Wing or installation commander."
(i) "The HORSE needs to develop . . . a management structure into the theater of operation scenarios."

AREA 6: PERSONNEL/SKILLS

23. Are all of the skills currently assigned to the unit needed for RED HORSE contingency support operations? If you believe some are not needed, please note those and explain why.

(a) "I question asphalt and concrete mobile because they are Army missions and require significant logistic support to operate."
(b) Yes
(c) Yes
(d) All are needed.
(e) All are needed.
(f) "All are needed, and in addition we need a contracting officer . . ."
(g) "All are needed."
(h) No answer.
(i) No answer.

24. How would you rank the following AFSCs, (1 for most important, 9 for least) in increasing the self-sufficiency of RED HORSE?

_____	- 90270.....Medical Service Technician (2)
_____	- 751x2.....Training Technician (2)
_____	- 672xx.....Financial Manager (2)
_____	- 645xx.....Supply (14)
_____	- 566xx.....Environmental Support (5)
_____	- 6616-.....Logistics Officer
_____	- 7024-.....Family Physician
_____	- 472xx.....Vehicle Maintainers (38)
_____	- 427xx.....Machine Shop Tech (2)

A	B	C	D	E	F	G	H	I	J	K	
7	3	4	-	-	2	3	1	2			- 90270
8	9	9	-	-	8	8	8	9			- 751x2
9	7	5	-	-	6	6	7	8			- 672xx
2	5	2	-	-	3	4	2	5			- 645xx
5	6	3	-	-	7	7	6	1			- 566xx
4	8	6	-	-	4	1	9	6			- 6616-
6	4	7	-	-	9	9	3	3			- 7024-
1	1	1	-	-	1	2	4	4			- 472xx
3	2	8	-	-	5	5	5	7			- 427xx

25. Bare Base operations may be divided into 3 phases: (1) initial base development--1 to 30 days, (2) operations and maintenance--31 to 90 days, (3) Sustained operations--longer than 90 days. In which phase of operations would you say the following AFSCs would be needed the most? Place a 1, 2, and/or 3 by each AFSC to specify the phase of operation.

_____	- 90270.....Medical Service Technician (2)
_____	- 751x2.....Training Technician (2)
_____	- 672xx.....Financial Manager (2)
_____	- 645xx.....Supply (14)
_____	- 566xx.....Environmental Support (5)
_____	- 6616-.....Logistics Officer
_____	- 7024-.....Family Physician
_____	- 472xx.....Vehicle Maintainers (38)
_____	- 427xx.....Machine Shop Tech (2)

A	B	C	D	E	F	
1	1	1,2,3	1,2,3	-	1	- 90270
3	3	3	3	-	3	- 751x2
3	3	2,3	3	-	3	- 672xx
1,2,3	2	1,2,3	1,2,3	-	2	- 645xx
1,2,3	2	1,2,3	3	-	3	- 566xx
1,2,3	2	2,3	1,2,3	-	2	- 6616-
1	1	2,3	2,3	-	3	- 7024-
1,2,3	1	1,2,3	1,2,3	-	2	- 472xx
1,2,3	1	2,3	1,2,3	-	2	- 427xx

G	H	I	J	K	L	
1	2	1		-	1	- 90270
3	3	3	3	-	3	- 751x2
3	3	3	3	-	3	- 672xx
1	1	2	1,2,3	-	2	- 645xx
1	2	1	3	-	3	- 566xx
2	3	2	1,2,3	-	2	- 6616-
3	1	2	2,3	-	3	- 7024-
2	1	2	1,2,3	-	2	- 472xx
3	2	3	1,2,3	-	2	- 427xx

AREA 7: SUGGESTED FORCE STRUCTURES

When you evaluate the suggested mobility configurations that follow, please also consider the following qualities for a mobile Civil Engineering force:

(1) Ability to quickly mobilize personnel and/or equipment
(2) Ability to transition from peacetime mode to wartime configuration.
(3) Ability to accomplish heavy bomb-damage repair.
(4) Reliability of contingency engineering capabilities.
(5) Command and control relationships.

Five options are provided for your review. Feel free to comment on each option or recommend others. Please indicate (in the space provided below) which option you believe has the greatest potential for future applications.

(a) "For deliberate planning we need the whole shooting match--all men and all equipment." "For crisis action planning we need force modules--... small portions of RH special capabilities when and where needed." "Therefore it makes no difference how you package the unit for deliberate planning because we need it all. Most critical is the force multiplier effect of 400 people. Additionally we expect to hire a contingent of local nationals as laborers much like was done in Vietnam. Bottom line--we need RH units and lots of them. Not smaller pieces at different time. Option #2 fits best and it is what were doing."

(b) Option 4. It is light, mobile, easily deployed, self-sufficient and contains all the capabilities of current units.

(c) None of the options fully satisfy important requirements such as (1) organizing in peacetime the way you expect to fight in war and (2) taking full advantage of multi-skilled labor.
COMMENTS: Option #2 might present some command and control problems. Options 3, 4, and 5 lack refueling capability and seem to have slow response times.

(d) "The most difficult factor in deploying a RED HORSE unit to accomplish heavy-engineering work either for contingencies or war damage repair is transporting the heavy equipment. In wartime . . . lift will be extremely limited. The transport . . . will be the most difficult no matter what the configuration. Small jobs which require smaller equipment could be transported by air, but then this type of work could

also be done by Prime BEEF troops, unless it is a specialized job like well drilling. Prepositioning the heavy equipment . . . will improve the response time tremendously, especially if deploying from CONUS. If a RED HORSE unit deploys to a contingency not requiring a whole RH unit, then a advon team should deploy early t determine the requirements. The contingency requirements may not require a UTC as configured in any of these options."

"My opinion is that the RH echelons . . . should be left as they are. With computerized systems, these UTCs can be tailored as the commanders see fit. Reorganizing the RH structure into any of these options would not obtain/provide the flexibility a commander needs to respond to any contingency."

(e) Option 2. However, they all will work if you have the proper leadership. In a big war, current UTCs are appropriate if you can get the airlift. If the HORSE is not already in theater it is not going to get there. Once in theater, task organization would be appropriate.

(f) Likes Option 1 but thinks Option 2 is more flexible for predetermined tasks.

(g) "I feel that Option 2 is the most supportable by the war planners and still ensures that RED HORSE equipment is available when needed.

(h) Option 5.

(i) Option 2 is the best ". . . if coupled with prepositioning."

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RED HORSE (RH) units cannot quickly deploy under current guidelines. The problem is mostly the incompatibleness of operational guidelines with modern constraints. Solutions exist in theory, but predictions of success must involve changes in deployment planning, the current "buzz word" being "force module" applications. This study defines the criteria for RH force module applications. This approach should bring about a more responsive deployment capability by way of well developed planning.

Research included reviews of historical documents and past studies such as RELOOK. Experts were surveyed to develop additional data in support of criteria development. The survey process was accomplished as a Delphi study which is a data collection procedure for refining the opinions of experts. The Delphi process normally involves several iterations of expert interviews with the goal of reaching a consensus among respondents.

Twenty experts were selected, but only nine participated. Fortunately, nine is an acceptable sample size for Delphi processes. A consensus of expert opinion was reached on most of the questions pertaining to criteria development.

Results suggest basing force module criteria on multi-attribute and multi-objective decision making. Many of the criteria were defined while analyzing such attributes as survivability and responsiveness under given constraints. The criteria aim towards optimal balance of capability and responsiveness in the framework of combat support doctrine. Some of the broadly defined constraints include geography and economics. Recommendations include applying this decision framework to a quantitative decision analysis technique.

Additionally, the results indicate RH modules can be modified or scaled down without significant impacts to heavy repair capability. The recommendation is to first identify the incremental relationships between heavy repair capability and quantities of people and equipment.